

DEX-0142

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INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁷ : C12N 15/12, A01K 67/027, C07K 14/47, C12Q 1/68, C07K 16/18, C12N 15/11, G01N 33/53	A3	(11) International Publication Number: WO 00/12702 (43) International Publication Date: 9 March 2000 (09.03.00)
(21) International Application Number: PCT/US99/19424 (22) International Filing Date: 30 August 1999 (30.08.99) (30) Priority Data: 60/098,639 31 August 1998 (31.08.98) US 60/117,393 27 January 1999 (27.01.99) US (71) Applicant (for all designated States except US): BAYER CORPORATION [US/US]; 333 Coney Street, East Walpole, MA 02032 (US). (72) Inventors; and (75) Inventors/Applicants (for US only): ENDEGE, Wilson, O. [KE/US]; 222 Normandy Drive, Norwood, MA 02062 (US). STEINMANN, Kathleen, E. [US/US]; 115 Washington Street, Unit 3B, Winchester, MA 01890 (US). ASTLE, Jon, H. [US/US]; 42 Short Street, Taunton, MA 02780 (US). BURGESS, Christopher, C. [US/US]; 97 Canton Terrace, Westwood, MA 02090 (US). CARROLL, Eddie, III [US/US]; Apartment 3, 1175 Washington Street, Norwood, MA 02062 (US). CATINO, Theodore, J. [US/US]; 18 Jo Paul Drive, Attleboro, MA 02702 (US). DWIVEDI, Poornima [US/US]; 10 Haven Road, Medfield, MA 02052 (US). FORD, Donna, M. [US/US]; 8 Morningside Road,	Plainville, MA 02762 (US). LEWIS, Marcia, E. [US/US]; 67 Wheelwright Farm, Cohasset, MA 02025 (US). MOLINO, Gary, A. [US/US]; 3 Essex Street, Norfolk, MA 02056 (US). MONAHAN, John, E. [US/US]; 942 West Street, Walpole, MA 02081 (US). SCHLEGEL, Robert [US/US]; 211 Melrose Street, Auburndale, MA 02466 (US). (74) Agents: ROESLER, Judith, A.; Bayer Corporation, 63 North Street, Medfield, MA 02052 (US) et al. (81) Designated States: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG). Published <i>With international search report.</i> (88) Date of publication of the international search report: 8 September 2000 (08.09.00)	
(54) Title: HUMAN GENES DIFFERENTIALLY EXPRESSED IN COLORECTAL CANCER (57) Abstract This invention relates to novel human genes, to proteins expressed by the genes, and to variants of the proteins. The invention also relates to diagnostic assays and therapeutic agents related to the genes and proteins, including probes, antisense constructs, and antibodies. The subject nucleic acids have been found to be differentially regulated in tumor cells, particularly in colon cancer tissue.		

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INTERNATIONAL SEARCH REPORT

Int. J. Application No

PCT/US 99/19424

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 C12N15/12 A01K67/027 C07K14/47 C12Q1/68 C07K16/18
 C12N15/11 G01N33/53

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C12N C12Q C07K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EMBL Database Hum2:SEQ ID HS23K20 Human DNA sequence from clone 23K20 on chromosome Xq25-26.2 XP002126133 compare nucleotides 37007-37027 of HS23K20 with nucleotides 513-493 in SEQ ID NO:1 ---	2,8,15, 30
X	EMBL Database Hum2:SEQ ID HS24M15 Human DNA sequence from PAC 24M15 on chromosome 1, contains tenascin-R (restrictin). 16 April 1997 XP002126134 compare nucleotides 98498-98510 of HS24M15 with nucleotides 506-494 in SEQ ID NO:1 of this application --- -/-	8,15,30



Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

* Special categories of cited documents:

- *A* document defining the general state of the art which is not considered to be of particular relevance
 E earlier document but published on or after the international filing date
 L document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
 O document referring to an oral disclosure, use, exhibition or other means
 P document published prior to the international filing date but later than the priority date claimed

- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
 X document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
 Y document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
 Z document member of the same patent family

Date of the actual completion of the international search

17 December 1999

Date of mailing of the international search report

05.04.2000

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
 NL - 2280 HV Rijswijk
 Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
 Fax: (+31-70) 340-3016

Authorized officer

CUPIDO, M

INTERNATIONAL SEARCH REPORT

Int. l. Application No
PCT/US 99/19424

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	SCHWEINFEST C W ET AL: "Subtraction hybridization cDNA libraries from colon carcinoma and hepatic cancer" GENE ANALYSIS TECHNIQUES, vol. 7, 1 January 1990 (1990-01-01), pages 64-70, XP002089887 ISSN: 0735-0651 page 64 ---	1,18
A	VIDER B ET AL: "Human colorectal carcinogenesis is associated with deregulation of homeobox gene expression" BIOCHEMICAL AND BIOPHYSICAL RESEARCH COMMUNICATIONS, vol. 232, no. 3, March 1997 (1997-03), pages 742-748, XP002104685 ISSN: 0006-291X page 742 ---	1
A	JAU MIN WONG ET AL: "UBIQUITIN-RIBOSOMAL PROTEIN S27A GENE OVEREXPRESSES IN HUMAN COLORECTAL CARCINOMA IS AN EARLY GROWTH RESPONSE GENE" CANCER RESEARCH, vol. 53, no. 8, 15 April 1993 (1993-04-15), pages 1916-1920, XP002024627 ISSN: 0008-5472 page 1916 ---	1
A	VAN BELZEN N ET AL: "A novel gene which is up-regulated during colon epithelial cell differentiation and down-regulated in colorectal neoplasms" LABORATORY INVESTIGATION, vol. 77, no. 1, 1 July 1997 (1997-07-01), pages 85-92, XP002089891 ISSN: 0023-6837 page 85 ---	1
A	KONDOH N ET AL.: "Differential expression of S19 ribosomal protein, laminin-binding protein, and human lymphocyte antigen class-I messenger RNAs associated with colon-carcinoma progression and differentiation" CANCER RESEARCH., vol. 52, no. 4, 15 February 1992 (1992-02-15), pages 791-796, XP002119317 BALTIMORE, US ISSN: 0008-5472 the whole document --- -/--	1

INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 99/19424

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 95 11923 A (DANA FARBER CANCER INST INC) 4 May 1995 (1995-05-04) page 1, line 29 -page 6, line 17 page 19, line 7 -page 29, line 11 ---	1-6,9, 10,14, 17-25, 31-34
A	EP 0 284 362 A (ICI PLC) 28 September 1988 (1988-09-28) the whole document -----	1-25, 27-34

INTERNATIONAL SEARCH REPORT

international application No.

PCT/US 99/ 19424

Box I Observations where certain claims were found unsearchable (Continuation of Item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☒ Claims Nos.: 26
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:

see FURTHER INFORMATION sheet PCT/ISA/210
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-25,27,28,29-34 (all partially)

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box 3.

Claims Nos.: 26

Claim 26 relates to an agent which alters the expression in a cell of a nucleic acid. As this agent has not been disclosed in the application, a meaningful search could not be performed.

The applicant's attention is drawn to the fact that claims, or parts of claims, relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Claims: 1-25, 27,28, 29-34, all partially

Invention 1:

An isolated nucleic acid comprising a nucleotide sequence which hybridizes under stringent conditions to SEQ.ID.No:1 or a sequence complementary thereto; an isolated nucleic acid, comprising a nucleotide sequence at least 80% identical to at least 15 consecutive nucleotides of SEQ.ID.No:1 or a sequence complementary thereto; an isolated nucleic acid comprising nucleotide sequence of SEQ.ID.No:1 or a sequence complementary thereto; an expression vector comprising said nucleic acids; an host cell comprising said vector; a transgenic animal having a transgene comprising said nucleic acids; a nucleic acid hybridizing to a nucleic acid probe corresponding to at least 12 consecutive nucleotides of SEQ.ID.No:1; a probe/primer hybridizing to a nucleic acid probe corresponding to at least 12 consecutive nucleotides of SEQ.ID.No:1; an isolated polypeptide encoded by said nucleic acid; an antibody that specifically binds to said polypeptide; an antisense oligonucleotide which hybridizes under stringent conditions to at least 12 consecutive nucleic acids of SEQ.ID.No:1; a test kit comprising said probe/primer; a testkit comprising said antibody; a method for determining the phenotype of a cell comprising detecting the differential expression of a nucleic acid which hybridizes under stringent conditions to at least 12 consecutive nucleic acids of SEQ.ID. No:1 or a protein encoded by said nucleic acid; a method for determining the presence or absence of a nucleic acid which hybridizes under stringent conditions to at least 12 consecutive nucleic acids of SEQ.ID.No:1; a method for detecting a mutation in a test nucleic acid which hybridizes under stringent conditions to at least 12 consecutive nucleic acids of SEQ.ID.No:1; a method for identifying an agent which alters the level of expression in a cell of a nucleic acid which hybridizes under stringent conditions to at least 12 consecutive nucleic acids of SEQ.ID.No:1; a pharmaceutical composition comprising a nucleic acid which hybridizes under stringent conditions to at least 12 consecutive nucleic acids of SEQ.ID.No:1; a pharmaceutical composition comprising a polypeptide encoded by said nucleic acid; a method for detecting cancer using SEQ.ID.No:1 or an antibody to a protein encoded by said sequence, as a probe.

Claims: 1-25, 27,28 30-34, all partially

Inventions 2 to 35:

Idem as invention 1, wherein each invention relates to the nucleic acid encoded by SEQ.ID.Nos:2 to 35 in stead of SEQ.ID.No:1.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Claims: 8,10-14,16-22,24,25,27,29,31-34, all partially

Inventions 36 to 168:

Idem as invention 1, wherein each invention relates to the nucleic acid encoded by SEQ.ID.Nos:36 to 168 in stead of SEQ.ID.No:1.

Claims: 16-21,24,25, 27,28,31-34, all partially

Inventions 169 to 544:

Idem as invention 1, wherein each invention relates to the nucleic acid encoded by SEQ.ID.Nos:169 to 544 in stead of SEQ.ID.No:1.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 99/19424

Patent document cited in search report		Publication date		Patent family member(s)		Publication date
WO 9511923	A	04-05-1995	CA	2175380 A		04-05-1995
			EP	0725799 A		14-08-1996
			US	5889159 A		30-03-1999
			US	5872235 A		16-02-1999

EP 0284362	A	28-09-1988	AU	625169 B		02-07-1992
			AU	1337888 A		22-09-1988
			DK	159788 A		24-09-1988
			FI	881388 A		24-09-1988
			JP	1034291 A		03-02-1989
			NO	881273 A		26-09-1988
			NZ	223985 A		28-05-1991
			PT	87055 A,B		01-04-1988
			ZA	8802082 A		28-12-1988

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(21) International Application Number: PCT/US99/19424 (22) International Filing Date: 30 August 1999 (30.08.99) (30) Priority Data: 60/098,639 31 August 1998 (31.08.98) US 60/117,393 27 January 1999 (27.01.99) US (71) Applicant (for all designated States except US): BAYER CORPORATION [US/US]; 333 Coney Street, East Walpole, MA 02032 (US). (72) Inventors; and (75) Inventors/Applicants (for US only): ENDEGE, Wilson, O. [KE/US]; 222 Normandy Drive, Norwood, MA 02062 (US). STEINMANN, Kathleen, E. [US/US]; 115 Washington Street, Unit 3B, Winchester, MA 01890 (US). ASTLE, Jon, H. [US/US]; 42 Short Street, Taunton, MA 02780 (US). BURGESS, Christopher, C. [US/US]; 97 Canton Terrace, Westwood, MA 02090 (US). CARROLL, Eddie, III [US/US]; Apartment 3, 1175 Washington Street, Norwood, MA 02062 (US). CATINO, Theodore, J. [US/US]; 18 Jo Paul Drive, Attleboro, MA 02702 (US). DWIVEDI, Poornima [US/US]; 10 Haven Road, Medfield, MA 02052 (US). FORD, Donna, M. [US/US]; 8 Morningside Road,		Plainville, MA 02762 (US). LEWIS, Marcia, E. [US/US]; 67 Wheelwright Farm, Cohasset, MA 02025 (US). MOLINO, Gary, A. [US/US]; 3 Essex Street, Norfolk, MA 02056 (US). MONAHAN, John, E. [US/US]; 942 West Street, Walpole, MA 02081 (US). SCHLEGEL, Robert [US/US]; 211 Melrose Street, Auburndale, MA 02466 (US). (74) Agents: ROESLER, Judith, A.; Bayer Corporation, 63 North Street, Medfield, MA 02052 (US) et al. (81) Designated States: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG). Published Without international search report and to be republished upon receipt of that report.
(54) Title: HUMAN GENES DIFFERENTIALLY EXPRESSED IN COLORECTAL CANCER		
(57) Abstract This invention relates to novel human genes, to proteins expressed by the genes, and to variants of the proteins. The invention also relates to diagnostic assays and therapeutic agents related to the genes and proteins, including probes, antisense constructs, and antibodies. The subject nucleic acids have been found to be differentially regulated in tumor cells, particularly in colon cancer tissue.		

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HUMAN GENES DIFFERENTIALLY EXPRESSED IN COLORECTAL CANCER

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Related Application Information

This application is based on Provisional Application Nos. 60/117,393, filed January 27, 1999, and 60/098,639, filed August 31, 1998, which are incorporated herein by reference in their entirety.

10

Field of the Invention

The present invention provides nucleic acid sequences and proteins encoded thereby, as well as probes derived from the nucleic acid sequences, antibodies directed to the encoded proteins, and diagnostic methods for detecting cancerous cells, especially colon cancer cells.

15

Background of the Invention

Colorectal carcinoma is a malignant neoplastic disease. There is a high incidence of colorectal carcinoma in the Western world, particularly in the United States. Tumors of this type often metastasize through lymphatic and vascular channels. Many patients with colorectal carcinoma eventually die from this disease. In fact, it is estimated that 62,000 persons in the United States alone die of colorectal carcinoma annually.

However, if diagnosed early, colon cancer may be treated effectively by surgical removal of the cancerous tissue. Colorectal cancers originate in the colorectal epithelium and typically are not extensively vascularized (and therefore not invasive) during the early stages of development. Colorectal cancer is thought to result from the clonal expansion of a single mutant cell in the epithelial lining of the colon or rectum. The transition to a highly vascularized, invasive and ultimately metastatic cancer which spreads throughout the body commonly takes ten years or longer. If the cancer is detected prior to invasion, surgical removal of the cancerous tissue is an effective cure. However, colorectal cancer is often detected only upon manifestation of clinical symptoms, such as pain and black tarry stool. Generally, such symptoms are present only when the disease is well established, often after metastasis has occurred, and the

prognosis for the patient is poor, even after surgical resection of the cancerous tissue. Early detection of colorectal cancer therefore is important in that detection may significantly reduce its morbidity.

Invasive diagnostic methods such as endoscopic examination allow for direct
5 visual identification, removal, and biopsy of potentially cancerous growths such as polyps. Endoscopy is expensive, uncomfortable, inherently risky, and therefore not a practical tool for screening populations to identify those with colorectal cancer. Non-invasive analysis of stool samples for characteristics indicative of the presence of colorectal cancer or precancer is a preferred alternative for early diagnosis, but no
10 known diagnostic method is available which reliably achieves this goal. A reliable, non-invasive, and accurate technique for diagnosing colon cancer at an early stage would help save many lives.

Summary of the Invention

15 The present invention provides nucleic acid sequences and proteins encoded thereby, as well as probes derived from the nucleic acid sequences, antibodies directed to the encoded proteins, and diagnostic methods for detecting cancerous cells, especially colon cancer cells. The sequences disclosed herein have been found to be
20 differentially expressed in samples obtained from colon cancer cell lines and/or colon cancer tissue. The 544 sequences that were obtained were analyzed by "blasting" the sequences against the publicly available databases; based upon the Blast search results it was found that SEQ ID Nos: 1-35 contained novel sequences, SEQ ID Nos: 36-168 contained EST sequences and SEQ ID Nos: 169-544 contained known sequences.

25 In one aspect, the invention provides an isolated nucleic acid comprising a nucleotide sequence which hybridizes under stringent conditions to a sequence of SEQ ID Nos. 1-544 or a sequence complementary thereto. In a related embodiment, the nucleic acid is at least about 80% or about 100% identical to a sequence corresponding to at least about 12, at least about 15, at least about 25, or at least about
30 40 consecutive nucleotides up to the full length of one of SEQ ID Nos. 1-544 or a sequence complementary thereto or up to the full length of the gene of which said sequence is a fragment. In certain embodiments, a nucleic acid of the present invention includes at least about five, at least about ten, or at least about twenty

nucleic acids from a region designated as novel in Table 2. In certain other embodiments, a nucleic acid of the present invention includes at least about five, at least about ten, or at least about twenty nucleotides which are not included in corresponding clones whose accession numbers are listed in Table 2.

5 In another aspect, the invention provides an isolated nucleic acid comprising a nucleotide sequence which hybridizes under stringent conditions to a sequence of SEQ ID Nos. 1-168, preferably SEQ ID Nos. 1-35, or a sequence complementary thereto. In a related embodiment, the nucleic acid is at least about 80% or about 100% identical to a sequence corresponding to at least about 12, at least about 15, at
10 least about 25, or at least about 40 consecutive nucleotides up to the full length of one of SEQ ID Nos. 1-168, preferably SEQ ID Nos. 1-35 or a sequence complementary thereto or up to the full length of the gene of which said sequence is a fragment. In certain embodiments, a nucleic acid of the present invention includes at least about five, at least about ten, or at least about twenty nucleic acids from a region designated
15 as novel in Table 2. In certain other embodiments, a nucleic acid of the present invention includes at least about five, at least about ten, or at least about twenty nucleotides which are not included in corresponding clones whose accession numbers are listed in Table 2.

In one embodiment, the invention provides a nucleic acid comprising a
20 nucleotide sequence which hybridizes under stringent conditions to a sequence of SEQ ID Nos. 1-168, preferably SEQ ID Nos. 1-35, or a sequence complementary thereto, and a transcriptional regulatory sequence operably linked to the nucleotide sequence to render the nucleotide sequence suitable for use as an expression vector. In another embodiment, the nucleic acid may be included in an expression vector capable
25 of replicating in a prokaryotic or eukaryotic cell. In a related embodiment, the invention provides a host cell transfected with the expression vector.

In another embodiment, the invention provides a transgenic animal having a transgene of a nucleic acid comprising a nucleotide sequence which hybridizes under stringent conditions to a sequence of SEQ ID Nos. 1-168, preferably SEQ ID Nos 1-
30 35, or a sequence complementary thereto incorporated in cells thereof. The transgene modifies the level of expression of the nucleic acid, the stability of a mRNA transcript of the nucleic acid, or the activity of the encoded product of the nucleic acid.

In yet another embodiment, the invention provides substantially pure nucleic acid which hybridizes under stringent conditions to a nucleic acid probe corresponding to at least about 12, at least about 15, at least about 25, or at least about 40 consecutive nucleotides up to the full length of one of SEQ ID Nos. 1-168, preferably SEQ ID Nos 1-35, or a sequence complementary thereto or up to the full length of the gene of which said sequence is a fragment. The invention also provides an antisense oligonucleotide analog which hybridizes under stringent conditions to at least 12, at least 25, or at least 50 consecutive nucleotides of one of SEQ ID Nos. 1-544 up to the full length of one of SEQ ID Nos. 1-544 or a sequence complementary thereto or up to the full length of the gene of which said sequence is a fragment, and which is resistant to cleavage by a nuclease, preferably an endogenous endonuclease or exonuclease.

In another embodiment, the invention provides a probe/primer comprising a substantially purified oligonucleotide, said oligonucleotide containing a region of nucleotide sequence which hybridizes under stringent conditions to at least about 12, at least about 15, at least about 25, or at least about 40 consecutive nucleotides of sense or antisense sequence selected from SEQ ID Nos. 1-168 up to the full length of one of SEQ ID Nos. 1-168 or a sequence complementary thereto or up to the full length of the gene of which said sequence is a fragment. In preferred embodiments, the probe selectively hybridizes with a target nucleic acid. In another embodiment, the probe may include a label group attached thereto and able to be detected. The label group may be selected from radioisotopes, fluorescent compounds, enzymes, and enzyme co-factors. The invention further provides arrays of at least about 10, at least about 25, at least about 50, or at least about 100 different probes as described above attached to a solid support.

In yet another embodiment, the invention pertains to a method of determining the phenotype of a cell, comprising detecting the differential expression, relative to a normal cell, of at least one nucleic acid which hybridizes under stringent conditions to one of SEQ ID Nos. 1-544, wherein the nucleic acid is differentially expressed by at least a factor of two, at least a factor of five, at least a factor of twenty, or at least a factor of fifty.

In another aspect, the invention provides polypeptides encoded by the subject nucleic acids. In one embodiment, the invention pertains to a polypeptide including an

amino acid sequence encoded by a nucleic acid comprising a nucleotide sequence which hybridizes under stringent conditions to a sequence of SEQ ID Nos. 1-168 or a sequence complementary thereto, or a fragment comprising at least about 25, or at least about 40 amino acids thereof. Further provided are antibodies immunoreactive
5 with these polypeptides.

In still another aspect, the invention provides diagnostic methods. In one embodiment, the invention pertains to a method for determining the phenotype of cells from a patient by providing a nucleic acid probe comprising a nucleotide sequence having at least 12, at least about 15, at least about 25, or at least about 40
10 consecutive nucleotides represented in a sequence of SEQ ID Nos. 1-544 up to the full length of one of SEQ ID Nos. 1-544 or a sequence complementary thereto or up to the full length of the gene of which said sequence is a fragment, obtaining a sample of cells from a patient, providing a second sample of cells substantially all of which are non-cancerous, contacting the nucleic acid probe under stringent conditions with
15 mRNA of each of said first and second cell samples, and comparing (a) the amount of hybridization of the probe with mRNA of the first cell sample, with (b) the amount of hybridization of the probe with mRNA of the second cell sample, wherein a difference of at least a factor of two, at least a factor of five, at least a factor of twenty, or at least a factor of fifty in the amount of hybridization with the mRNA of the first cell sample
20 as compared to the amount of hybridization with the mRNA of the second cell sample is indicative of the phenotype of cells in the first cell sample. Determining the phenotype includes determining the genotype, as the term is used herein.

In another embodiment, the invention provides a test kit for identifying an transformed cells, comprising a probe/primer as described above, for measuring a
25 level of a nucleic acid which hybridizes under stringent conditions to a nucleic acid of SEQ ID Nos. 1-544 in a sample of cells isolated from a patient. In certain embodiments, the kit may further include instructions for using the kit, solutions for suspending or fixing the cells, detectable tags or labels, solutions for rendering a nucleic acid susceptible to hybridization, solutions for lysing cells, or solutions for the
30 purification of nucleic acids.

In another embodiment, the invention provides a method of determining the phenotype of a cell, comprising detecting the differential expression, relative to a normal cell, of at least one protein encoded by a nucleic acid which hybridizes under

stringent conditions to one of SEQ ID Nos. 1-544, wherein the protein is differentially expressed by at least a factor of two, at least a factor of five, at least a factor of twenty, or at least a factor of fifty. In one embodiment, the level of the protein is detected in an immunoassay. The invention also pertains to a method for determining the

5 presence or absence of a nucleic acid which hybridizes under stringent conditions to one of SEQ ID Nos. 1-168 in a cell, comprising contacting the cell with a probe as described above. The invention further provides a method for determining the presence or absence of a subject polypeptide encoded by a nucleic acid which hybridizes under stringent conditions to one of SEQ ID Nos. 1-168 in a cell,

10 comprising contacting the cell with an antibody as described above. In yet another embodiment, the invention provides a method for determining the presence of an aberrant mutation (e.g., deletion, insertion, or substitution of nucleic acids) or aberrant methylation in a gene which hybridizes under stringent conditions to a sequence of SEQ ID Nos. 1-168 or a sequence complementary thereto, comprising collecting a

15 sample of cells from a patient, isolating nucleic acid from the cells of the sample, contacting the nucleic acid sample with one or more primers which specifically hybridize to a nucleic acid sequence of SEQ ID Nos. 1-544 under conditions such that hybridization and amplification of the nucleic acid occurs, and comparing the presence, absence, or size of an amplification product to the amplification product of a

20 normal cell.

In one embodiment, the invention provides a test kit for identifying transformed cells, comprising an antibody specific for a protein encoded by a nucleic acid which hybridizes under stringent conditions to any one of SEQ Nos. 1-544. In certain embodiments, the kit further includes instructions for using the kit. In certain

25 embodiments, the kit may further include instructions for using the kit, solutions for suspending or fixing the cells, detectable tags or labels, solutions for rendering a polypeptide susceptible to the binding of an antibody, solutions for lysing cells, or solutions for the purification of polypeptides.

In yet another aspect, the invention provides pharmaceutical compositions

30 including the subject nucleic acids. In one embodiment, an agent which alters the level of expression in a cell of a nucleic acid which hybridizes under stringent conditions to one of SEQ ID Nos. 1-544 or a sequence complementary thereto is identified by providing a cell, treating the cell with a test agent, determining the level

of expression in the cell of a nucleic acid which hybridizes under stringent conditions to one of SEQ ID Nos. 1-544 or a sequence complementary thereto, and comparing the level of expression of the nucleic acid in the treated cell with the level of expression of the nucleic acid in an untreated cell, wherein a change in the level of expression of the nucleic acid in the treated cell relative to the level of expression of the nucleic acid in the untreated cell is indicative of an agent which alters the level of expression of the nucleic acid in a cell. The invention further provides a pharmaceutical composition comprising an agent identified by this method. In another embodiment, the invention provides a pharmaceutical composition which includes a polypeptide encoded by a nucleic acid having a nucleotide sequence that hybridizes under stringent conditions to one of SEQ ID Nos. 1-544 or a sequence complementary thereto. In one embodiment, the invention pertains to a pharmaceutical composition comprising a nucleic acid including a sequence which hybridizes under stringent conditions to one of SEQ ID Nos. 1-544 or a sequence complementary thereto.

15

Brief Description of the Figure

The figure depicts an exemplary assay result for determining differential expression of gene products in cells.

20

Detailed Description of the Invention

The invention relates to nucleic acids having the disclosed nucleotide sequences (SEQ ID Nos. 1-544), as well as full length cDNA, mRNA, and genes corresponding to these sequences, and to polypeptides and proteins encoded by these nucleic acids and genes, and portions thereof.

25

Also included are polypeptides and proteins encoded by the nucleic acids of SEQ ID Nos. 1-544. The various nucleic acids that can encode these polypeptides and proteins differ because of the degeneracy of the genetic code, in that most amino acids are encoded by more than one triplet codon. The identity of such codons is well known in this art, and this information can be used for the construction of the nucleic acids within the scope of the invention.

30

Nucleic acids encoding polypeptides and proteins that are variants of the polypeptides and proteins encoded by the nucleic acids and related cDNA and genes are also within the scope of the invention. The variants differ from wild-type protein in having one or more amino acid substitutions that either enhance, add, or diminish a

biological activity of the wild-type protein. Once the amino acid change is selected, a nucleic acid encoding that variant is constructed according to the invention.

The following detailed description discloses how to obtain or make full-length cDNA and human genes corresponding to the nucleic acids, how to express these
5 nucleic acids and genes, how to identify structural motifs of the genes, how to identify the function of a protein encoded by a gene corresponding to an nucleic acid, how to use nucleic acids as probes in mapping and in tissue profiling, how to use the corresponding polypeptides and proteins to raise antibodies, and how to use the nucleic acids, polypeptides, and proteins for therapeutic and diagnostic purposes.

10 The sequences investigated herein have been found to be differentially expressed in samples obtained from colon cancer tissue. However, it is also believed that these sequences may also have utility with other types of cancer. In a related application, PCT/IB99/01062, filed June 9, 1999, the inventors disclosed nucleic acid sequences that are differentially expressed in colon cancer-derived cell lines, such as
15 SW 480, relative to the expression levels in normal tissue, e.g., normal colon tissue and/or normal non-colon tissue. In this application, Table 3 lists nucleic acid sequences which are over-expressed in both cancer cell line SW 480 as well colon cancer tissue obtained from various patients.

Accordingly, certain aspects of the present invention relate to nucleic acids
20 differentially expressed in tumor tissue, especially colon cancer cell lines, polypeptides encoded by such nucleic acids, and antibodies immunoreactive with these polypeptides, and preparations of such compositions. Moreover, the present invention provides diagnostic and therapeutic assays and reagents for detecting and treating disorders involving, for example, aberrant expression of the subject nucleic
25 acids.

I. General

This invention relates in part to novel methods for identifying and/or classifying cancerous cells present in a human tumors, particularly in solid tumors,
30 e.g., carcinomas and sarcomas, such as, for example, breast or colon cancers. The method uses genes that are differentially expressed in cancer cell lines and/or cancer tissue compared with related normal cells, such as normal colon cells, and thereby

identifies or classifies tumor cells by the upregulation and/or downregulation of expression of particular genes, an event which is implicated in tumorigenesis.

Upregulation or increased expression of certain genes such as oncogenes, act to promote malignant growth. Downregulation or decreased expression of genes such as tumor suppressor genes also promotes malignant growth. Thus, alteration in the expression of either type of gene is a potential diagnostic indicator for determining whether a subject is at risk of developing or has cancer, e.g., colon cancer.

Accordingly, in one aspect, the invention also provides biomarkers, such as nucleic acid markers, for human tumor cells, e.g., for colon cancer cells. The invention also provides proteins encoded by these nucleic acid markers.

The invention also features methods for identifying drugs useful for treatment of such cancer cells, and for treatment of a cancerous condition, such as colon cancer. Unlike prior methods, the invention provides a means for identifying cancer cells at an early stage of development, so that premalignant cells can be identified prior to their spreading throughout the human body. This allows early detection of potentially cancerous conditions, and treatment of those cancerous conditions prior to spread of the cancerous cells throughout the body, or prior to development of an irreversible cancerous condition.

II. Definitions

For convenience, the meaning of certain terms and phrases used in the specification, examples, and appended claims, are provided below.

The term "an aberrant expression", as applied to a nucleic acid of the present invention, refers to level of expression of that nucleic acid which differs from the level of expression of that nucleic acid in healthy tissue, or which differs from the activity of the polypeptide present in a healthy subject. An activity of a polypeptide can be aberrant because it is stronger than the activity of its native counterpart. Alternatively, an activity can be aberrant because it is weaker or absent relative to the activity of its native counterpart. An aberrant activity can also be a change in the activity; for example, an aberrant polypeptide can interact with a different target peptide. A cell can have an aberrant expression level of a gene due to overexpression or underexpression of that gene.

The term "agonist", as used herein, is meant to refer to an agent that mimics or upregulates (e.g., potentiates or supplements) the bioactivity of a protein. An agonist can be a wild-type protein or derivative thereof having at least one bioactivity of the wild-type protein. An agonist can also be a compound that upregulates expression of a gene or which increases at least one bioactivity of a protein. An agonist can also be a compound which increases the interaction of a polypeptide with another molecule, e.g., a target peptide or nucleic acid.

The term "allele", which is used interchangeably herein with "allelic variant", refers to alternative forms of a gene or portions thereof. Alleles occupy the same locus or position on homologous chromosomes. When a subject has two identical alleles of a gene, the subject is said to be homozygous for that gene or allele. When a subject has two different alleles of a gene, the subject is said to be heterozygous for the gene. Alleles of a specific gene can differ from each other in a single nucleotide, or several nucleotides, and can include substitutions, deletions, and/or insertions of nucleotides. An allele of a gene can also be a form of a gene containing mutations.

The term "allelic variant of a polymorphic region of a gene" refers to a region of a gene having one of several nucleotide sequences found in that region of the gene in other individuals.

"Antagonist" as used herein is meant to refer to an agent that downregulates (e.g., suppresses or inhibits) at least one bioactivity of a protein. An antagonist can be a compound which inhibits or decreases the interaction between a protein and another molecule, e.g., a target peptide or enzyme substrate. An antagonist can also be a compound that downregulates expression of a gene or which reduces the amount of expressed protein present.

The term "antibody" as used herein is intended to include whole antibodies, e.g., of any isotype (IgG, IgA, IgM, IgE, etc), and includes fragments thereof which are also specifically reactive with a vertebrate, e.g., mammalian, protein. Antibodies can be fragmented using conventional techniques and the fragments screened for utility in the same manner as described above for whole antibodies. Thus, the term includes segments of proteolytically-cleaved or recombinantly-prepared portions of an antibody molecule that are capable of selectively reacting with a certain protein. Nonlimiting examples of such proteolytic and/or recombinant fragments include Fab, F(ab')₂, Fab', Fv, and single chain antibodies (scFv) containing a V[L] and/or V[H]

domain joined by a peptide linker. The scFv's may be covalently or non-covalently linked to form antibodies having two or more binding sites. The subject invention includes polyclonal, monoclonal, or other purified preparations of antibodies and recombinant antibodies.

5 The phenomenon of "apoptosis" is well known, and can be described as a programmed death of cells. As is known, apoptosis is contrasted with "necrosis", a phenomenon when cells die as a result of being killed by a toxic material, or other external effect. Apoptosis involves chromatic condensation, membrane blebbing, and fragmentation of DNA, all of which are generally visible upon microscopic
10 examination.

 A disease, disorder, or condition "associated with" or "characterized by" an aberrant expression of a nucleic acid refers to a disease, disorder, or condition in a subject which is caused by, contributed to by, or causative of an aberrant level of expression of a nucleic acid.

15 As used herein the term "bioactive fragment of a polypeptide" refers to a fragment of a full-length polypeptide, wherein the fragment specifically agonizes (mimics) or antagonizes (inhibits) the activity of a wild-type polypeptide. The bioactive fragment preferably is a fragment capable of interacting with at least one other molecule, e.g., protein, small molecule, or DNA, which a full length protein can
20 bind.

 "Biological activity" or "bioactivity" or "activity" or "biological function", which are used interchangeably, herein mean an effector or antigenic function that is directly or indirectly performed by a polypeptide (whether in its native or denatured conformation), or by any subsequence thereof. Biological activities include binding
25 to polypeptides, binding to other proteins or molecules, activity as a DNA binding protein, as a transcription regulator, ability to bind damaged DNA, etc. A bioactivity can be modulated by directly affecting the subject polypeptide. Alternatively, a bioactivity can be altered by modulating the level of the polypeptide, such as by modulating expression of the corresponding gene.

30 The term "biomarker" refers a biological molecule, e.g., a nucleic acid, peptide, hormone, etc., whose presence or concentration can be detected and correlated with a known condition, such as a disease state.

"Cells," "host cells", or "recombinant host cells" are terms used interchangeably herein. It is understood that such terms refer not only to the particular subject cell but to the progeny or potential progeny of such a cell. Because certain modifications may occur in succeeding generations due to either mutation or environmental influences, such progeny may not, in fact, be identical to the parent cell, but are still included within the scope of the term as used herein.

A "chimeric polypeptide" or "fusion polypeptide" is a fusion of a first amino acid sequence encoding one of the subject polypeptides with a second amino acid sequence defining a domain (e.g., polypeptide portion) foreign to and not substantially homologous with any domain of the subject polypeptide. A chimeric polypeptide may present a foreign domain which is found (albeit in a different polypeptide) in an organism which also expresses the first polypeptide, or it may be an "interspecies," "intergenic," etc., fusion of polypeptide structures expressed by different kinds of organisms. In general, a fusion polypeptide can be represented by the general formula $(X)_n-(Y)_m-(Z)_n$, wherein Y represents a portion of the subject polypeptide, and X and Z are each independently absent or represent amino acid sequences which are not related to the native sequence found in an organism, or which are not found as a polypeptide chain contiguous with the subject sequence, where m is an integer greater than or equal to one, and each occurrence of n is, independently, 0 or an integer greater than or equal to 1 (n and m are preferably no greater than 5 or 10).

A "delivery complex" shall mean a targeting means (e.g., a molecule that results in higher affinity binding of a nucleic acid, protein, polypeptide or peptide to a target cell surface and/or increased cellular or nuclear uptake by a target cell). Examples of targeting means include: sterols (e.g., cholesterol), lipids (e.g., a cationic lipid, virosome or liposome), viruses (e.g., adenovirus, adeno-associated virus, and retrovirus), or target cell-specific binding agents (e.g., ligands recognized by target cell specific receptors). Preferred complexes are sufficiently stable *in vivo* to prevent significant uncoupling prior to internalization by the target cell. However, the complex is cleavable under appropriate conditions within the cell so that the nucleic acid, protein, polypeptide or peptide is released in a functional form.

As is well known, genes or a particular polypeptide may exist in single or multiple copies within the genome of an individual. Such duplicate genes may be identical or may have certain modifications, including nucleotide substitutions,

additions or deletions, which all still code for polypeptides having substantially the same activity. The term "DNA sequence encoding a polypeptide" may thus refer to one or more genes within a particular individual. Moreover, certain differences in nucleotide sequences may exist between individual organisms, which are called
5 alleles. Such allelic differences may or may not result in differences in amino acid sequence of the encoded polypeptide yet still encode a polypeptide with the same biological activity.

The term "equivalent" is understood to include nucleotide sequences encoding functionally equivalent polypeptides. Equivalent nucleotide sequences will include
10 sequences that differ by one or more nucleotide substitutions, additions or deletions, such as allelic variants; and will, therefore, include sequences that differ from the nucleotide sequence of the nucleic acids shown in SEQ ID NOs: 1-544 due to the degeneracy of the genetic code.

As used herein, the terms "gene", "recombinant gene", and "gene construct"
15 refer to a nucleic acid of the present invention associated with an open reading frame, including both exon and (optionally) intron sequences.

A "recombinant gene" refers to nucleic acid encoding a polypeptide and comprising exon sequences, though it may optionally include intron sequences which are derived from, for example, a related or unrelated chromosomal gene. The term
20 "intron" refers to a DNA sequence present in a given gene which is not translated into protein and is generally found between exons.

The term "growth" or "growth state" of a cell refers to the proliferative state of a cell as well as to its differentiative state. Accordingly, the term refers to the phase of the cell cycle in which the cell is, e.g., G0, G1, G2, prophase, metaphase, or telophase,
25 as well as to its state of differentiation, e.g., undifferentiated, partially differentiated, or fully differentiated. Without wanting to be limited, differentiation of a cell is usually accompanied by a decrease in the proliferative rate of a cell.

"Homology" or "identity" or "similarity" refers to sequence similarity between two peptides or between two nucleic acid molecules, with identity being a more strict
30 comparison. Homology and identity can each be determined by comparing a position in each sequence which may be aligned for purposes of comparison. When a position in the compared sequence is occupied by the same base or amino acid, then the molecules are identical at that position. A degree of homology or similarity or

identity between nucleic acid sequences is a function of the number of identical or matching nucleotides at positions shared by the nucleic acid sequences. A degree of identity of amino acid sequences is a function of the number of identical amino acids at positions shared by the amino acid sequences. A degree of homology or similarity
5 of amino acid sequences is a function of the number of amino acids, i.e., structurally related, at positions shared by the amino acid sequences. An "unrelated" or "non-homologous" sequence shares less than 40% identity, though preferably less than 25% identity, with one of the sequences of the present invention.

The term "percent identical" refers to sequence identity between two amino
10 acid sequences or between two nucleotide sequences. Identity can each be determined by comparing a position in each sequence which may be aligned for purposes of comparison. When an equivalent position in the compared sequences is occupied by the same base or amino acid, then the molecules are identical at that position; when the equivalent site occupied by the same or a similar amino acid residue (e.g., similar
15 in steric and/or electronic nature), then the molecules can be referred to as homologous (similar) at that position. Expression as a percentage of homology, similarity, or identity refers to a function of the number of identical or similar amino acids at positions shared by the compared sequences. Various alignment algorithms and/or programs may be used, including FASTA, BLAST, or ENTREZ. FASTA and
20 BLAST are available as a part of the GCG sequence analysis package (University of Wisconsin, Madison, Wis.), and can be used with, e.g., default settings. ENTREZ is available through the National Center for Biotechnology Information, National Library of Medicine, National Institutes of Health, Bethesda, Md. In one embodiment, the percent identity of two sequences can be determined by the GCG program with a
25 gap weight of 1, e.g., each amino acid gap is weighted as if it were a single amino acid or nucleotide mismatch between the two sequences.

Other techniques for alignment are described in Methods in Enzymology, vol. 266: Computer Methods for Macromolecular Sequence Analysis (1996), ed. Doolittle, Academic Press, Inc., a division of Harcourt Brace & Co., San Diego, California,
30 USA. Preferably, an alignment program that permits gaps in the sequence is utilized to align the sequences. The Smith-Waterman is one type of algorithm that permits gaps in sequence alignments. See Meth. Mol. Biol. 70: 173-187 (1997). Also, the GAP program using the Needleman and Wunsch alignment method can be utilized to

align sequences. An alternative search strategy uses MPSRCH software, which runs on a MASPAR computer. MPSRCH uses a Smith-Waterman algorithm to score sequences on a massively parallel computer. This approach improves ability to pick up distantly related matches, and is especially tolerant of small gaps and nucleotide sequence errors. Nucleic acid-encoded amino acid sequences can be used to search both protein and DNA databases.

Databases with individual sequences are described in Methods in Enzymology, ed. Doolittle, *supra*. Databases include Genbank, EMBL, and DNA Database of Japan (DDBJ).

Preferred nucleic acids have a sequence at least 70%, and more preferably 80% identical and more preferably 90% and even more preferably at least 95% identical to a nucleic acid sequence of a sequence shown in one of SEQ ID NOS: 1-544. Nucleic acids at least 90%, more preferably 95%, and most preferably at least about 98-99% identical with a nucleic sequence represented in one of SEQ ID NOS: 1-544 are of course also within the scope of the invention. In preferred embodiments, the nucleic acid is mammalian.

The term "interact" as used herein is meant to include detectable interactions (e.g., biochemical interactions) between molecules, such as interaction between protein-protein, protein-nucleic acid, nucleic acid-nucleic acid, and protein-small molecule or nucleic acid-small molecule in nature.

The term "isolated" as used herein with respect to nucleic acids, such as DNA or RNA, refers to molecules separated from other DNAs, or RNAs, respectively, that are present in the natural source of the macromolecule. The term isolated as used herein also refers to a nucleic acid or peptide that is substantially free of cellular material, viral material, or culture medium when produced by recombinant DNA techniques, or chemical precursors or other chemicals when chemically synthesized. Moreover, an "isolated nucleic acid" is meant to include nucleic acid fragments which are not naturally occurring as fragments and would not be found in the natural state. The term "isolated" is also used herein to refer to polypeptides which are isolated from other cellular proteins and is meant to encompass both purified and recombinant polypeptides.

The terms "modulated" and "differentially regulated" as used herein refer to both upregulation (i.e., activation or stimulation (e.g., by agonizing or potentiating))

and downregulation (i.e., inhibition or suppression (e.g., by antagonizing, decreasing or inhibiting)).

The term "mutated gene" refers to an allelic form of a gene, which is capable of altering the phenotype of a subject having the mutated gene relative to a subject which does not have the mutated gene. If a subject must be homozygous for this mutation to have an altered phenotype, the mutation is said to be recessive. If one copy of the mutated gene is sufficient to alter the genotype of the subject, the mutation is said to be dominant. If a subject has one copy of the mutated gene and has a phenotype that is intermediate between that of a homozygous and that of a heterozygous subject (for that gene), the mutation is said to be co-dominant.

The designation "N", where it appears in the accompanying Sequence Listing, indicates that the identity of the corresponding nucleotide is unknown. "N" should therefore not necessarily be interpreted as permitting substitution with any nucleotide, e.g., A, T, C, or G, but rather as holding the place of a nucleotide whose identity has not been conclusively determined.

The "non-human animals" of the invention include mammals such as rodents, non-human primates, sheep, dog, cow, chickens, amphibians, reptiles, etc. Preferred non-human animals are selected from the rodent family including rat and mouse, most preferably mouse, though transgenic amphibians, such as members of the *Xenopus* genus, and transgenic chickens can also provide important tools for understanding and identifying agents which can affect, for example, embryogenesis and tissue formation. The term "chimeric animal" is used herein to refer to animals in which the recombinant gene is found, or in which the recombinant gene is expressed in some but not all cells of the animal. The term "tissue-specific chimeric animal" indicates that one of the recombinant genes is present and/or expressed or disrupted in some tissues but not others.

As used herein, the term "nucleic acid" refers to polynucleotides such as deoxyribonucleic acid (DNA), and, where appropriate, ribonucleic acid (RNA). The term should also be understood to include, as equivalents, analogs of either RNA or DNA made from nucleotide analogs, and, as applicable to the embodiment being described, single (sense or antisense) and double-stranded polynucleotides. ESTs, chromosomes, cDNAs, mRNAs, and rRNAs are representative examples of molecules that may be referred to as nucleic acids.

The term "nucleotide sequence complementary to the nucleotide sequence of SEQ ID NO. x" refers to the nucleotide sequence of the complementary strand of a nucleic acid strand having SEQ ID NO. x. The term "complementary strand" is used herein interchangeably with the term "complement". The complement of a nucleic acid strand can be the complement of a coding strand or the complement of a non-coding strand.

The term "polymorphism" refers to the coexistence of more than one form of a gene or portion (e.g., allelic variant) thereof. A portion of a gene of which there are at least two different forms, i.e., two different nucleotide sequences, is referred to as a "polymorphic region of a gene". A polymorphic region can be a single nucleotide, the identity of which differs in different alleles. A polymorphic region can also be several nucleotides long.

A "polymorphic gene" refers to a gene having at least one polymorphic region.

As used herein, the term "promoter" means a DNA sequence that regulates expression of a selected DNA sequence operably linked to the promoter, and which effects expression of the selected DNA sequence in cells. The term encompasses "tissue specific" promoters, i.e., promoters which effect expression of the selected DNA sequence only in specific cells (e.g., cells of a specific tissue). The term also covers so-called "leaky" promoters, which regulate expression of a selected DNA primarily in one tissue, but cause expression in other tissues as well. The term also encompasses non-tissue specific promoters and promoters that constitutively expressed or that are inducible (i.e., expression levels can be controlled).

The terms "protein", "polypeptide", and "peptide" are used interchangeably herein when referring to a gene product.

The term "recombinant protein" refers to a polypeptide of the present invention which is produced by recombinant DNA techniques, wherein generally, DNA encoding a polypeptide is inserted into a suitable expression vector which is in turn used to transform a host cell to produce the heterologous protein. Moreover, the phrase "derived from", with respect to a recombinant gene, is meant to include within the meaning of "recombinant protein" those proteins having an amino acid sequence of a native polypeptide, or an amino acid sequence similar thereto which is generated by mutations including substitutions and deletions (including truncation) of a naturally occurring form of the polypeptide.

"Small molecule" as used herein, is meant to refer to a composition, which has a molecular weight of less than about 5 kD and most preferably less than about 4 kD. Small molecules can be nucleic acids, peptides, polypeptides, peptidomimetics, carbohydrates, lipids or other organic (carbon-containing) or inorganic molecules.

- 5 Many pharmaceutical companies have extensive libraries of chemical and/or biological mixtures, often fungal, bacterial, or algal extracts, which can be screened with any of the assays of the invention to identify compounds that modulate a bioactivity.

As used herein, the term "specifically hybridizes" or "specifically detects" refers to the ability of a nucleic acid molecule of the invention to hybridize to at least a portion of, for example, approximately 6, 12, 15, 20, 30, 50, 100, 150, 200, 300, 350, 400, 500, 750, or 1000 contiguous nucleotides of a nucleic acid designated in any one of SEQ ID Nos: 1-544, or a sequence complementary thereto, or naturally occurring mutants thereof, such that it has less than 15%, preferably less than 10%, and more preferably less than 5% background hybridization to a cellular nucleic acid (e.g., mRNA or genomic DNA) encoding a different protein. In preferred
15 embodiments, the oligonucleotide probe detects only a specific nucleic acid, e.g., it does not substantially hybridize to similar or related nucleic acids, or complements thereof.

20 "Transcriptional regulatory sequence" is a generic term used throughout the specification to refer to DNA sequences, such as initiation signals, enhancers, and promoters, which induce or control transcription of protein coding sequences with which they are operably linked. In preferred embodiments, transcription of one of the genes is under the control of a promoter sequence (or other transcriptional regulatory sequence) which controls the expression of the recombinant gene in a cell-type in
25 which expression is intended. It will also be understood that the recombinant gene can be under the control of transcriptional regulatory sequences which are the same or which are different from those sequences which control transcription of the naturally-occurring forms of the polypeptide.

30 As used herein, the term "transfection" means the introduction of a nucleic acid, e.g., via an expression vector, into a recipient cell by nucleic acid-mediated gene transfer. "Transformation", as used herein, refers to a process in which a cell's genotype is changed as a result of the cellular uptake of exogenous DNA or RNA,

and, for example, the transformed cell expresses a recombinant form of a polypeptide or, in the case of anti-sense expression from the transferred gene, the expression of the target gene is disrupted.

As used herein, the term "transgene" means a nucleic acid sequence (or an antisense transcript thereto) which has been introduced into a cell. A transgene could be partly or entirely heterologous, i.e., foreign, to the transgenic animal or cell into which it is introduced, or, is homologous to an endogenous gene of the transgenic animal or cell into which it is introduced, but which is designed to be inserted, or is inserted, into the animal's genome in such a way as to alter the genome of the cell into which it is inserted (e.g., it is inserted at a location which differs from that of the natural gene or its insertion results in a knockout). A transgene can also be present in a cell in the form of an episome. A transgene can include one or more transcriptional regulatory sequences and any other nucleic acid, such as introns, that may be necessary for optimal expression of a selected nucleic acid.

A "transgenic animal" refers to any animal, preferably a non-human mammal, bird or an amphibian, in which one or more of the cells of the animal contain heterologous nucleic acid introduced by way of human intervention, such as by transgenic techniques well known in the art. The nucleic acid is introduced into the cell, directly or indirectly by introduction into a precursor of the cell, by way of deliberate genetic manipulation, such as by microinjection or by infection with a recombinant virus. The term genetic manipulation does not include classical cross-breeding, or *in vitro* fertilization, but rather is directed to the introduction of a recombinant DNA molecule. This molecule may be integrated within a chromosome, or it may be extra-chromosomally replicating DNA. In the typical transgenic animals described herein, the transgene causes cells to express a recombinant form of one of the subject polypeptide, e.g. either agonistic or antagonistic forms. However, transgenic animals in which the recombinant gene is silent are also contemplated, as for example, the FLP or CRE recombinase dependent constructs described below. Moreover, "transgenic animal" also includes those recombinant animals in which gene disruption of one or more genes is caused by human intervention, including both recombination and antisense techniques.

The term "treating" as used herein is intended to encompass curing as well as ameliorating at least one symptom of the condition or disease.

The term "vector" refers to a nucleic acid molecule capable of transporting another nucleic acid to which it has been linked. One type of preferred vector is an episome, i.e., a nucleic acid capable of extra-chromosomal replication. Preferred vectors are those capable of autonomous replication and/or expression of nucleic acids to which they are linked. Vectors capable of directing the expression of genes to which they are operatively linked are referred to herein as "expression vectors". In general, expression vectors of utility in recombinant DNA techniques are often in the form of "plasmids" which refer generally to circular double stranded DNA loops which, in their vector form are not bound to the chromosome. In the present specification, "plasmid" and "vector" are used interchangeably as the plasmid is the most commonly used form of vector. However, the invention is intended to include such other forms of expression vectors which serve equivalent functions and which become known in the art subsequently hereto.

The term "wild-type allele" refers to an allele of a gene which, when present in two copies in a subject results in a wild-type phenotype. There can be several different wild-type alleles of a specific gene, since certain nucleotide changes in a gene may not affect the phenotype of a subject having two copies of the gene with the nucleotide changes.

III. Nucleic Acids of the Present Invention

As described below, one aspect of the invention pertains to isolated nucleic acids, variants, and/or equivalents of such nucleic acids.

Nucleic acids of the present invention have been identified as differentially expressed in tumor cells, e.g., colon cancer-derived cell lines (relative to the expression levels in normal tissue, e.g., normal colon tissue and/or normal non-colon tissue), such as SEQ ID Nos. 1-544, preferably SEQ ID Nos. 1-168, even more preferably SEQ ID Nos. 1-35, or a sequence complementary thereto. In certain embodiments, the subject nucleic acids are differentially expressed by at least a factor of two, preferably at least a factor of five, even more preferably at least a factor of twenty, still more preferably at least a factor of fifty. Preferred nucleic acids include sequences identified as differentially expressed both in colon cancer cell tissue and colon cancer cell lines. In preferred embodiments, nucleic acids of the present invention are upregulated in tumor cells, especially colon cancer tissue and/or colon

cancer-derived cell lines. In another embodiment, nucleic acids of the present invention are downregulated in tumor cells, especially colon cancer tissue and/or colon cancer-derived cell lines.

Table 1 indicates those sequences which are over- or underexpressed in a colon cancer-derived cell line relative to normal tissue, and further designates those sequences which are also differentially regulated in colon cancer tissue. The designation O indicates that the corresponding sequence was overexpressed, M indicates possible overexpression, N indicates no differential expression, and U indicates underexpression.

Genes which are upregulated, such as oncogenes, or downregulated, such as tumor suppressors, in aberrantly proliferating cells may be targets for diagnostic or therapeutic techniques. For example, upregulation of the *cdc2* gene induces mitosis. Overexpression of the *myt1* gene, a mitotic deactivator, negatively regulates the activity of *cdc2*. Aberrant proliferation may thus be induced either by upregulating *cdc2* or by downregulating *myt1*. Similarly, downregulation of tumor suppressors such as *p53* and *Rb* have been implicated in tumorigenesis.

Particularly preferred polypeptides are those that are encoded by nucleic acid sequences at least about 70%, 75%, 80%, 90%, 95%, 97%, or 98% similar to a nucleic acid sequence of SEQ ID Nos. 1-544. Preferably, the nucleic acid includes all or a portion (e.g., at least about 12, at least about 15, at least about 25, or at least about 40 nucleotides) of the nucleotide sequence corresponding to the nucleic acid of SEQ ID Nos. 1-168, preferably SEQ ID Nos. 1-35, or a sequence complementary thereto.

Still other preferred nucleic acids of the present invention encode a polypeptide comprising at least a portion of a polypeptide encoded by one of SEQ ID Nos. 1-544. For example, preferred nucleic acid molecules for use as probes/primers or antisense molecules (i.e., noncoding nucleic acid molecules) can comprise at least about 12, 20, 30, 50, 60, 70, 80, 90, or 100 base pairs in length up to the length of the complete gene. Coding nucleic acid molecules can comprise, for example, from about 50, 60, 70, 80, 90, or 100 base pairs up to the length of the complete gene.

Another aspect of the invention provides a nucleic acid which hybridizes under low, medium, or high stringency conditions to a nucleic acid sequence represented by one of SEQ ID Nos. 1-168, preferably SEQ ID Nos. 1-35, or a sequence complementary thereto. Appropriate stringency conditions which promote

DNA hybridization, for example, 6.0 x sodium chloride/sodium citrate (SSC) at about 45 °C, followed by a wash of 2.0 x SSC at 50 °C, are known to those skilled in the art or can be found in Current Protocols in Molecular Biology, John Wiley & Sons, N.Y. (1989), 6.3.1-12.3.6. For example, the salt concentration in the wash step can be
5 selected from a low stringency of about 2.0 x SSC at 50 °C to a high stringency of about 0.2 x SSC at 50 °C. In addition, the temperature in the wash step can be increased from low stringency conditions at room temperature, about 22 °C, to high stringency conditions at about 65 °C. Both temperature and salt may be varied, or temperature or salt concentration may be held constant while the other variable is
10 changed. In a preferred embodiment, a nucleic acid of the present invention will bind to one of SEQ ID Nos. 1-168, preferably SEQ ID Nos. 1-35, or a sequence complementary thereto, under moderately stringent conditions, for example at about 2.0 x SSC and about 40 °C. In a particularly preferred embodiment, a nucleic acid of the present invention will bind to one of SEQ ID Nos. 1-168, preferably SEQ ID Nos.
15 1-35, or a sequence complementary thereto, under high stringency conditions.

In one embodiment, the invention provides nucleic acids which hybridize under low stringency conditions of 6 x SSC at room temperature followed by a wash at 2 x SSC at room temperature.

In another embodiment, the invention provides nucleic acids which hybridize
20 under high stringency conditions of 2 x SSC at 65 °C followed by a wash at 0.2 x SSC at 65 °C.

Nucleic acids having a sequence that differs from the nucleotide sequences shown in one of SEQ ID Nos. 1-168, preferably SEQ ID Nos. 1-35, or a sequence complementary thereto, due to degeneracy in the genetic code, are also within the
25 scope of the invention. Such nucleic acids encode functionally equivalent peptides (i.e., a peptide having equivalent or similar biological activity) but differ in sequence from the sequence shown in the sequence listing due to degeneracy in the genetic code. For example, a number of amino acids are designated by more than one triplet. Codons that specify the same amino acid, or synonyms (for example, CAU and CAC
30 each encode histidine) may result in "silent" mutations which do not affect the amino acid sequence of a polypeptide. However, it is expected that DNA sequence polymorphisms that do lead to changes in the amino acid sequences of the subject polypeptides will exist among mammals. One skilled in the art will appreciate that

these variations in one or more nucleotides (e.g., up to about 3-5% of the nucleotides) of the nucleic acids encoding polypeptides having an activity of a polypeptide may exist among individuals of a given species due to natural allelic variation.

Also within the scope of the invention are nucleic acids encoding splicing
5 variants of proteins encoded by a nucleic acid of SEQ ID Nos. 1-544, preferably SEQ ID Nos. 1-168, even more preferably SEQ ID Nos. 1-35, or a sequence complementary thereto, or natural homologs of such proteins. Such homologs can be cloned by hybridization or PCR, as further described herein.

The polynucleotide sequence may also encode for a leader sequence, e.g., the
10 natural leader sequence or a heterologous leader sequence, for a subject polypeptide. For example, the desired DNA sequence may be fused in the same reading frame to a DNA sequence which aids in expression and secretion of the polypeptide from the host cell, for example, a leader sequence which functions as a secretory sequence for controlling transport of the polypeptide from the cell. The protein having a leader
15 sequence is a preprotein and may have the leader sequence cleaved by the host cell to form the mature form of the protein.

The polynucleotide of the present invention may also be fused in frame to a marker sequence, also referred to herein as "Tag sequence" encoding a "Tag peptide", which allows for marking and/or purification of the polypeptide of the present
20 invention. In a preferred embodiment, the marker sequence is a hexahistidine tag, e.g., supplied by a PQE-9 vector. Numerous other Tag peptides are available commercially. Other frequently used Tags include myc-epitopes (e.g., see Ellison et al. (1991) *J Biol Chem* 266:21150-21157) which includes a 10-residue sequence from c-myc, the pFLAG system (International Biotechnologies, Inc.), the pEZZ-protein A
25 system (Pharmacia, NJ), and a 16 amino acid portion of the *Haemophilus influenza* hemagglutinin protein. Furthermore, any polypeptide can be used as a Tag so long as a reagent, e.g., an antibody interacting specifically with the Tag polypeptide is available or can be prepared or identified.

As indicated by the examples set out below, nucleic acids can be obtained
30 from mRNA present in any of a number of eukaryotic cells, e.g., and are preferably obtained from metazoan cells, more preferably from vertebrate cells, and even more preferably from mammalian cells. It should also be possible to obtain nucleic acids of the present invention from genomic DNA from both adults and embryos. For

example, a gene can be cloned from either a cDNA or a genomic library in accordance with protocols generally known to persons skilled in the art. cDNA can be obtained by isolating total mRNA from a cell, e.g., a vertebrate cell, a mammalian cell, or a human cell, including embryonic cells. Double stranded cDNAs can then be prepared from
5 the total mRNA, and subsequently inserted into a suitable plasmid or bacteriophage vector using any one of a number of known techniques. The gene can also be cloned using established polymerase chain reaction techniques in accordance with the nucleotide sequence information provided by the invention.

In certain embodiments, a nucleic acid, probe, vector, or other construct of the
10 present invention includes at least about five, at least about ten, or at least about twenty nucleic acids from a region designated as novel in Table 2. In certain other embodiments, a nucleic acid of the present invention includes at least about five, at least about ten, or at least about twenty nucleic acids which are not included in the clones whose accession numbers are listed in Table 2.

15 The invention includes within its scope a polynucleotide having the nucleotide sequence of nucleic acid obtained from this biological material, wherein the nucleic acid hybridizes under stringent conditions (at least about 4 x SSC at 65 °C, or at least about 4 x SSC at 42 °C; see, for example, U.S. Patent No. 5,707,829, incorporated herein by reference) with at least 15 contiguous nucleotides of at least one of SEQ ID
20 Nos. 1-544. By this is intended that when at least 15 contiguous nucleotides of one of SEQ ID Nos. 1-544 is used as a probe, the probe will preferentially hybridize with a gene or mRNA (of the biological material) comprising the complementary sequence, allowing the identification and retrieval of the nucleic acids of the biological material that uniquely hybridize to the selected probe. Probes from more than one of SEQ ID
25 Nos. 1-544 will hybridize with the same gene or mRNA if the cDNA from which they were derived corresponds to one mRNA. Probes of more than 15 nucleotides can be used, but 15 nucleotides represents enough sequence for unique identification.

Because the present nucleic acids represent partial mRNA transcripts, two or more nucleic acids of the invention may represent different regions of the same
30 mRNA transcript and the same gene. Thus, if two or more of SEQ ID Nos. 1-544 are identified as belonging to the same clone, then either sequence can be used to obtain the full-length mRNA or gene.

Nucleic acid-related polynucleotides can also be isolated from cDNA libraries. These libraries are preferably prepared from mRNA of human colon cells, more preferably, human colon cancer specific tissue, designated as the DE clones in the appended Tables. In another embodiment the nucleic acids are isolated from libraries
5 prepared from normal colon specific tissue, designated herein as PA clones in the appended Tables. In yet another embodiment, this invention discloses nucleic acid sequences that can be isolated from both libraries prepared from a human colon adenocarcinoma cell line, SW480, as well as from libraries prepared from either normal colon specific tissue or from colon cancer specific tissue. These sequences are
10 listed in Table 3. Alignment of SEQ ID Nos. 1-544, as described above, can indicate that a cell line or tissue source of a related protein or polynucleotide can also be used as a source of the nucleic acid-related cDNA.

Techniques for producing and probing nucleic acid sequence libraries are described, for example, in Sambrook *et al.*, "Molecular Cloning: A Laboratory
15 Manual" (New York, Cold Spring Harbor Laboratory, 1989). The cDNA can be prepared by using primers based on a sequence from SEQ ID Nos. 1-544. In one embodiment, the cDNA library can be made from only poly-adenylated mRNA. Thus, poly-T primers can be used to prepare cDNA from the mRNA. Alignment of SEQ ID Nos. 1-544 can result in identification of a related polypeptide or
20 polynucleotide. Some of the polynucleotides disclosed herein contains repetitive regions that were subject to masking during the search procedures. The information about the repetitive regions is discussed below.

Constructs of polynucleotides having sequences of SEQ ID Nos. 1-544 can be generated synthetically. Alternatively, single-step assembly of a gene and entire
25 plasmid from large numbers of oligodeoxyribonucleotides is described by Stemmer *et al.*, *Gene (Amsterdam)* (1995) 164(1):49-53. In this method, assembly PCR (the synthesis of long DNA sequences from large numbers of oligodeoxyribonucleotides (oligos)) is described. The method is derived from DNA shuffling (Stemmer, *Nature* (1994) 370:389-391), and does not rely on DNA ligase, but instead relies on DNA
30 polymerase to build increasingly longer DNA fragments during the assembly process. For example, a 1.1-kb fragment containing the TEM-1 beta-lactamase-encoding gene (*bla*) can be assembled in a single reaction from a total of 56 oligos, each 40 nucleotides (nt) in length. The synthetic gene can be PCR amplified and cloned in a

vector containing the tetracycline-resistance gene (Tc-R) as the sole selectable marker. Without relying on ampicillin (Ap) selection, 76% of the Tc-R colonies were Ap-R, making this approach a general method for the rapid and cost-effective synthesis of any gene.

5

IV. Identification of Functional and Structural Motifs of Novel Genes Using Art-Recognized Methods

Translations of the nucleotide sequence of the nucleic acids, cDNAs, or full
10 genes can be aligned with individual known sequences. Similarity with individual sequences can be used to determine the activity of the polypeptides encoded by the polynucleotides of the invention. For example, sequences that show similarity with a chemokine sequence may exhibit chemokine activities. Also, sequences exhibiting similarity with more than one individual sequence may exhibit activities that are
15 characteristic of either or both individual sequences.

The full length sequences and fragments of the polynucleotide sequences of the nearest neighbors can be used as probes and primers to identify and isolate the full length sequence of the nucleic acid. The nearest neighbors can indicate a tissue or cell type to be used to construct a library for the full-length sequences of the nucleic acid.

20 Typically, the nucleic acids are translated in all six frames to determine the best alignment with the individual sequences. The sequences disclosed herein in the Sequence Listing are in a 5' to 3' orientation and translation in three frames can be sufficient (with a few specific exceptions as described in the Examples). These amino acid sequences are referred to, generally, as query sequences, which will be aligned
25 with the individual sequences.

Nucleic acid sequences can be compared with known genes by any of the methods disclosed above. Results of individual and query sequence alignments can be divided into three categories: high similarity, weak similarity, and no similarity. Individual alignment results ranging from high similarity to weak similarity provide a
30 basis for determining polypeptide activity and/or structure.

Parameters for categorizing individual results include: percentage of the alignment region length where the strongest alignment is found, percent sequence identity, and p value.

The percentage of the alignment region length is calculated by counting the number of residues of the individual sequence found in the region of strongest alignment. This number is divided by the total residue length of the query sequence to find a percentage. An example is shown below:

5

Query sequence:	ASNPERTMIPVTRVGLIRYM
Individual sequence:	YMMTEYLAIPV.RVGLPRYM
	1 5 10 15

10

The region of alignment begins at amino acid 9 and ends at amino acid 19. The total length of the query sequence is 20 amino acids. The percent of the alignment region length is 11/20 or 55%.

Percent sequence identity is calculated by counting the number of amino acid matches between the query and individual sequence and dividing total number of matches by the number of residues of the individual sequence found in the region of strongest alignment. For the example above, the percent identity would be 10 matches divided by 11 amino acids, or approximately 90.9%.

P value is the probability that the alignment was produced by chance. For a single alignment, the p value can be calculated according to Karlin *et al.*, Proc. Natl. Acad. Sci. 87: 2264 (1990) and Karlin *et al.*, Proc. Natl. Acad. Sci. 90: (1993). The p value of multiple alignments using the same query sequence can be calculated using an heuristic approach described in Altschul *et al.*, Nat. Genet. 6: 119 (1994).

Alignment programs such as BLAST program can calculate the p value.

The boundaries of the region where the sequences align can be determined according to Doolittle, *Methods in Enzymology*, *supra*; BLAST or FASTA programs; or by determining the area where the sequence identity is highest.

Another factor to consider for determining identity or similarity is the location of the similarity or identity. Strong local alignment can indicate similarity even if the length of alignment is short. Sequence identity scattered throughout the length of the query sequence also can indicate a similarity between the query and profile sequences.

High Similarity

For the alignment results to be considered high similarity, the percent of the alignment region length, typically, is at least about 55% of total length query sequence; more typically, at least about 58%; even more typically; at least about 60%
5 of the total residue length of the query sequence. Usually, percent length of the alignment region can be as much as about 62%; more usually, as much as about 64%; even more usually, as much as about 66%.

Further, for high similarity, the region of alignment, typically, exhibits at least about 75% of sequence identity; more typically, at least about 78%; even more
10 typically; at least about 80% sequence identity. Usually, percent sequence identity can be as much as about 82%; more usually, as much as about 84%; even more usually, as much as about 86%.

The p value is used in conjunction with these methods. If high similarity is found, the query sequence is considered to have high similarity with a profile
15 sequence when the p value is less than or equal to about 10^{-2} ; more usually; less than or equal to about 10^{-3} ; even more usually; less than or equal to about 10^{-4} . More typically, the p value is no more than about 10^{-5} ; more typically; no more than or equal to about 10^{-10} ; even more typically; no more than or equal to about 10^{-15} for the query sequence to be considered high similarity.

20

Weak Similarity

For the alignment results to be considered weak similarity, there is no minimum percent length of the alignment region nor minimum length of alignment. A better showing of weak similarity is considered when the region of alignment is,
25 typically, at least about 15 amino acid residues in length; more typically, at least about 20; even more typically; at least about 25 amino acid residues in length. Usually, length of the alignment region can be as much as about 30 amino acid residues; more usually, as much as about 40; even more usually, as much as about 60 amino acid residues.

30 Further, for weak similarity, the region of alignment, typically, exhibits at least about 35% of sequence identity; more typically, at least about 40%; even more typically; at least about 45% sequence identity. Usually, percent sequence identity

can be as much as about 50%; more usually, as much as about 55%; even more usually, as much as about 60%.

If low similarity is found, the query sequence is considered to have weak similarity with a profile sequence when the p value is usually less than or equal to about 10^{-2} ; more usually; less than or equal to about 10^{-3} ; even more usually; less than or equal to about 10^{-4} . More typically, the p value is no more than about 10^{-5} ; more usually; no more than or equal to about 10^{-10} ; even more usually; no more than or equal to about 10^{-15} for the query sequence to be considered weak similarity.

10 Similarity Determined by Sequence Identity

Sequence identity alone can be used to determine similarity of a query sequence to an individual sequence and can indicate the activity of the sequence. Such an alignment, preferably, permits gaps to align sequences. Typically, the query sequence is related to the profile sequence if the sequence identity over the entire query sequence is at least about 15%; more typically, at least about 20%; even more typically, at least about 25%; even more typically, at least about 50%. Sequence identity alone as a measure of similarity is most useful when the query sequence is usually, at least 80 residues in length; more usually, 90 residues; even more usually, at least 95 amino acid residues in length. More typically, similarity can be concluded based on sequence identity alone when the query sequence is preferably 100 residues in length; more preferably, 120 residues in length; even more preferably, 150 amino acid residues in length.

Determining Activity from Alignments with Profile and Multiple Aligned Sequences

25 Translations of the nucleic acids can be aligned with amino acid profiles that define either protein families or common motifs. Also, translations of the nucleic acids can be aligned to multiple sequence alignments (MSA) comprising the polypeptide sequences of members of protein families or motifs. Similarity or identity with profile sequences or MSAs can be used to determine the activity of the polypeptides encoded by nucleic acids or corresponding cDNA or genes. For example, sequences that show an identity or similarity with a chemokine profile or MSA can exhibit chemokine activities.

Profiles can be designed manually by (1) creating a MSA, which is an alignment of the amino acid sequence of members that belong to the family and (2) constructing

a statistical representation of the alignment. Such methods are described, for example, in Birney *et al.*, Nucl. Acid Res. 24(14): 2730-2739 (1996).

MSAs of some protein families and motifs are publicly available. For example, these include MSAs of 547 different families and motifs. These MSAs are described also in Sonnhammer *et al.*, Proteins 28: 405-420 (1997). Other sources are also available in the world wide web. A brief description of these MSAs is reported in Pascarella *et al.*, Prot. Eng. 9(3): 249-251 (1996).

Techniques for building profiles from MSAs are described in Sonnhammer *et al.*, *supra*; Birney *et al.*, *supra*; and Methods in Enzymology, vol. 266: "Computer Methods for Macromolecular Sequence Analysis," 1996, ed. Doolittle, Academic Press, Inc., a division of Harcourt Brace & Co., San Diego, California, USA.

Similarity between a query sequence and a protein family or motif can be determined by (a) comparing the query sequence against the profile and/or (b) aligning the query sequence with the members of the family or motif.

Typically, a program such as Searchwise can be used to compare the query sequence to the statistical representation of the multiple alignment, also known as a profile. The program is described in Birney *et al.*, *supra*. Other techniques to compare the sequence and profile are described in Sonnhammer *et al.*, *supra* and Doolittle, *supra*.

Next, methods described by Feng *et al.*, J. Mol. Evol. 25: 351-360 (1987) and Higgins *et al.*, CABIOS 5: 151-153 (1989) can be used align the query sequence with the members of a family or motif, also known as a MSA. Computer programs, such as PILEUP, can be used. See Feng *et al.*, *infra*.

The following factors are used to determine if a similarity between a query sequence and a profile or MSA exists: (1) number of conserved residues found in the query sequence, (2) percentage of conserved residues found in the query sequence, (3) number of frameshifts, and (4) spacing between conserved residues.

Some alignment programs that both translate and align sequences can make any number of frameshifts when translating the nucleotide sequence to produce the best alignment. The fewer frameshifts needed to produce an alignment, the stronger the similarity or identity between the query and profile or MSAs. For example, a weak similarity resulting from no frameshifts can be a better indication of activity or structure of a query sequence, than a strong similarity resulting from two frameshifts.

Preferably, three or fewer frameshifts are found in an alignment; more preferably two or fewer frameshifts; even more preferably, one or fewer frameshifts; even more preferably, no frameshifts are found in an alignment of query and profile or MSAs.

Conserved residues are those amino acids that are found at a particular
5 position in all or some of the family or motif members. For example, most known chemokines contain four conserved cysteines. Alternatively, a position is considered conserved if only a certain class of amino acids is found in a particular position in all or some of the family members. For example, the N-terminal position may contain a positively charged amino acid, such as lysine, arginine, or histidine.

10 Typically, a residue of a polypeptide is conserved when a class of amino acids or a single amino acid is found at a particular position in at least about 40% of all class members; more typically, at least about 50%; even more typically, at least about 60% of the members. Usually, a residue is conserved when a class or single amino acid is found in at least about 70% of the members of a family or motif; more usually,
15 at least about 80%; even more usually, at least about 90%; even more usually, at least about 95%.

A residue is considered conserved when three unrelated amino acids are found at a particular position in the some or all of the members; more usually, two unrelated amino acids. These residues are conserved when the unrelated amino acids are found
20 at particular positions in at least about 40% of all class member; more typically, at least about 50%; even more typically, at least about 60% of the members. Usually, a residue is conserved when a class or single amino acid is found in at least about 70% of the members of a family or motif; more usually, at least about 80%; even more usually, at least about 90%; even more usually, at least about 95%.

25 A query sequence has similarity to a profile or MSA when the query sequence comprises at least about 25% of the conserved residues of the profile or MSA; more usually, at least about 30%; even more usually, at least about 40%. Typically, the query sequence has a stronger similarity to a profile sequence or MSA when the query sequence comprises at least about 45% of the conserved residues of the profile or
30 MSA; more typically, at least about 50%; even more typically, at least about 55%.

V. Probes and Primers

The nucleotide sequences determined from the cloning of genes from tumor cells, especially colon cancer cell lines and tissues will further allow for the generation of probes and primers designed for identifying and/or cloning homologs in other cell types, e.g., from other tissues, as well as homologs from other mammalian organisms. Nucleotide sequences useful as probes/primers may include all or a portion of the sequences listed in SEQ ID Nos. 1-544 or sequences complementary thereto or sequences which hybridize under stringent conditions to all or a portion of SEQ ID Nos. 1-544. For instance, the present invention also provides a probe/primer comprising a substantially purified oligonucleotide, which oligonucleotide comprising a nucleotide sequence that hybridizes under stringent conditions to at least approximately 12, preferably 25, more preferably 40, 50, or 75 consecutive nucleotides up to the full length of the sense or anti-sense sequence selected from the group consisting of SEQ ID Nos. 1-544, preferably SEQ ID Nos. 1-168, even more preferably SEQ ID Nos. 1-35, or a sequence complementary thereto, or naturally occurring mutants thereof. For instance, primers based on a nucleic acid represented in SEQ ID Nos. 1-544, preferably SEQ ID Nos. 1-168, even more preferably SEQ ID Nos. 1-35, or a sequence complementary thereto, can be used in PCR reactions to clone homologs of that sequence.

In yet another embodiment, the invention provides probes/primers comprising a nucleotide sequence that hybridizes under moderately stringent conditions to at least approximately 12, 16, 25, 40, 50 or 75 consecutive nucleotides up to the full length of the sense or antisense sequence selected from the group consisting of SEQ ID Nos. 1-544, preferably SEQ ID Nos. 1-168, even more preferably SEQ ID Nos. 1-35, or naturally occurring mutants thereof.

In particular, these probes are useful because they provide a method for detecting mutations in wild-type genes of the present invention. Nucleic acid probes which are complementary to a wild-type gene of the present invention and can form mismatches with mutant genes are provided, allowing for detection by enzymatic or chemical cleavage or by shifts in electrophoretic mobility.

Likewise, probes based on the subject sequences can be used to detect transcripts or genomic sequences encoding the same or homologous proteins, for use, for example, in prognostic or diagnostic assays. In preferred embodiments, the probe

further comprises a label group attached thereto and able to be detected, e.g., the label group is selected from radioisotopes, fluorescent compounds, chemiluminescent compounds, enzymes, and enzyme co-factors.

Full-length cDNA molecules comprising the disclosed nucleic acids are
5 obtained as follows. A subject nucleic acid or a portion thereof comprising at least about 12, 15, 18, or 20 nucleotides up to the full length of a sequence represented in SEQ ID Nos. 1-544, preferably SEQ ID Nos. 1-168, even more preferably SEQ ID
10 Nos. 1-35, or a sequence complementary thereto, may be used as a hybridization probe to detect hybridizing members of a cDNA library using probe design methods, cloning methods, and clone selection techniques as described in U.S. Patent No.
5,654,173, "Secreted Proteins and Polynucleotides Encoding Them," incorporated herein by reference. Libraries of cDNA may be made from selected tissues, such as normal or tumor tissue, or from tissues of a mammal treated with, for example, a
15 pharmaceutical agent. Preferably, the tissue is the same as that used to generate the nucleic acids, as both the nucleic acid and the cDNA represent expressed genes. Most preferably, the cDNA library is made from the biological material described herein in the Examples. Alternatively, many cDNA libraries are available commercially.
(Sambrook *et al.*, *Molecular Cloning: A Laboratory Manual*, 2nd Ed. (Cold Spring Harbor Press, Cold Spring Harbor, NY 1989). The choice of cell type for library
20 construction may be made after the identity of the protein encoded by the nucleic acid-related gene is known. This will indicate which tissue and cell types are likely to express the related gene, thereby containing the mRNA for generating the cDNA.

Members of the library that are larger than the nucleic acid, and preferably that contain the whole sequence of the native message, may be obtained. To confirm that
25 the entire cDNA has been obtained, RNA protection experiments may be performed as follows. Hybridization of a full-length cDNA to an mRNA may protect the RNA from RNase degradation. If the cDNA is not full length, then the portions of the mRNA that are not hybridized may be subject to RNase degradation. This may be assayed, as is known in the art, by changes in electrophoretic mobility on
30 polyacrylamide gels, or by detection of released monoribonucleotides. Sambrook *et al.*, *Molecular Cloning: A Laboratory Manual*, 2nd Ed. (Cold Spring Harbor Press, Cold Spring Harbor, NY 1989). In order to obtain additional sequences 5' to the end

of a partial cDNA, 5' RACE (PCR Protocols: A Guide to Methods and Applications (Academic Press, Inc. 1990)) may be performed.

Genomic DNA may be isolated using nucleic acids in a manner similar to the isolation of full-length cDNAs. Briefly, the nucleic acids, or portions thereof, may be used as probes to libraries of genomic DNA. Preferably, the library is obtained from the cell type that was used to generate the nucleic acids. Most preferably, the genomic DNA is obtained from the biological material described herein in the Example. Such libraries may be in vectors suitable for carrying large segments of a genome, such as P1 or YAC, as described in detail in Sambrook *et al.*, 9.4-9.30. In addition, genomic sequences can be isolated from human BAC libraries, which are commercially available from Research Genetics, Inc., Huntsville, Alabama, USA, for example. In order to obtain additional 5' or 3' sequences, chromosome walking may be performed, as described in Sambrook *et al.*, such that adjacent and overlapping fragments of genomic DNA are isolated. These may be mapped and pieced together, as is known in the art, using restriction digestion enzymes and DNA ligase.

Using the nucleic acids of the invention, corresponding full length genes can be isolated using both classical and PCR methods to construct and probe cDNA libraries. Using either method, Northern blots, preferably, may be performed on a number of cell types to determine which cell lines express the gene of interest at the highest rate.

Classical methods of constructing cDNA libraries are taught in Sambrook *et al.*, supra. With these methods, cDNA can be produced from mRNA and inserted into viral or expression vectors. Typically, libraries of mRNA comprising poly(A) tails can be produced with poly(T) primers. Similarly, cDNA libraries can be produced using the instant sequences as primers.

PCR methods may be used to amplify the members of a cDNA library that comprise the desired insert. In this case, the desired insert may contain sequence from the full length cDNA that corresponds to the instant nucleic acids. Such PCR methods include gene trapping and RACE methods.

Gene trapping may entail inserting a member of a cDNA library into a vector. The vector then may be denatured to produce single stranded molecules. Next, a substrate-bound probe, such a biotinylated oligo, may be used to trap cDNA inserts of interest. Biotinylated probes can be linked to an avidin-bound solid substrate. PCR

methods can be used to amplify the trapped cDNA. To trap sequences corresponding to the full length genes, the labeled probe sequence may be based on the nucleic acids of the invention, e.g., SEQ ID Nos. 1-168, preferably SEQ ID Nos. 1-35, or a sequence complementary thereto. Random primers or primers specific to the library
5 vector can be used to amplify the trapped cDNA. Such gene trapping techniques are described in Gruber *et al.*, PCT WO 95/04745 and Gruber *et al.*, U.S. Pat. No. 5,500,356. Kits are commercially available to perform gene trapping experiments from, for example, Life Technologies, Gaithersburg, Maryland, USA.

“Rapid amplification of cDNA ends,” or RACE, is a PCR method of
10 amplifying cDNAs from a number of different RNAs. The cDNAs may be ligated to an oligonucleotide linker and amplified by PCR using two primers. One primer may be based on sequence from the instant nucleic acids, for which full length sequence is desired, and a second primer may comprise a sequence that hybridizes to the oligonucleotide linker to amplify the cDNA. A description of this method is reported
15 in PCT Pub. No. WO 97/19110.

In preferred embodiments of RACE, a common primer may be designed to anneal to an arbitrary adaptor sequence ligated to cDNA ends (Apte and Siebert, Biotechniques 15:890-893, 1993; Edwards *et al.*, Nuc. Acids Res. 19:5227-5232, 1991). When a single gene-specific RACE primer is paired with the common primer,
20 preferential amplification of sequences between the single gene specific primer and the common primer occurs. Commercial cDNA pools modified for use in RACE are available.

Another PCR-based method generates full-length cDNA library with anchored ends without specific knowledge of the cDNA sequence. The method uses lock-
25 docking primers (I-VI), where one primer, poly TV (I-III) locks over the polyA tail of eukaryotic mRNA producing first strand synthesis and a second primer, polyGH (IV-VI) locks onto the polyC tail added by terminal deoxynucleotidyl transferase (TdT). This method is described in PCT Pub. No. WO 96/40998.

The promoter region of a gene generally is located 5' to the initiation site for
30 RNA polymerase II. Hundreds of promoter regions contain the “TATA” box, a sequence such as TATTA or TATAA, which is sensitive to mutations. The promoter region can be obtained by performing 5' RACE using a primer from the coding region

of the gene. Alternatively, the cDNA can be used as a probe for the genomic sequence, and the region 5' to the coding region is identified by "walking up."

If the gene is highly expressed or differentially expressed, the promoter from the gene may be of use in a regulatory construct for a heterologous gene.

5 Once the full-length cDNA or gene is obtained, DNA encoding variants can be prepared by site-directed mutagenesis, described in detail in Sambrook *et al.*, 15.3-15.63. The choice of codon or nucleotide to be replaced can be based on the disclosure herein on optional changes in amino acids to achieve altered protein structure and/or function.

10 As an alternative method to obtaining DNA or RNA from a biological material, nucleic acid comprising nucleotides having the sequence of one or more nucleic acids of the invention can be synthesized. Thus, the invention encompasses nucleic acid molecules ranging in length from 12 nucleotides (corresponding to at least 12 contiguous nucleotides which hybridize under stringent conditions to or are at
15 least 80% identical to a nucleic acid represented by one of SEQ ID Nos. 1-544, preferably SEQ ID Nos. 1-168, even more preferably SEQ ID Nos. 1-35, or a sequence complementary thereto) up to a maximum length suitable for one or more biological manipulations, including replication and expression, of the nucleic acid molecule. The invention includes but is not limited to (a) nucleic acid having the size
20 of a full gene, and comprising at least one of SEQ ID Nos. 1-544, preferably SEQ ID Nos. 1-168, even more preferably SEQ ID Nos. 1-35, or a sequence complementary thereto; (b) the nucleic acid of (a) also comprising at least one additional gene, operably linked to permit expression of a fusion protein; (c) an expression vector comprising (a) or (b); (d) a plasmid comprising (a) or (b); and (e) a recombinant viral
25 particle comprising (a) or (b). Construction of (a) can be accomplished as described below in part IV.

 The sequence of a nucleic acid of the present invention is not limited and can be any sequence of A, T, G, and/or C (for DNA) and A, U, G, and/or C (for RNA) or modified bases thereof, including inosine and pseudouridine. The choice of sequence
30 will depend on the desired function and can be dictated by coding regions desired, the intron-like regions desired, and the regulatory regions desired.

VI. Vectors Carrying Nucleic Acids of the Present Invention

The invention further provides plasmids and vectors, which can be used to express a gene in a host cell. The host cell may be any prokaryotic or eukaryotic cell. Thus, a nucleotide sequence derived from any one of SEQ ID Nos. 1-544, preferably SEQ ID Nos. 1-168, even more preferably SEQ ID Nos. 1-35, or a sequence
5 complementary thereto, encoding all or a selected portion of a protein, can be used to produce a recombinant form of an polypeptide via microbial or eukaryotic cellular processes. Ligating the polynucleotide sequence into a gene construct, such as an expression vector, and transforming or transfecting into hosts, either eukaryotic (yeast, avian, insect or mammalian) or prokaryotic (bacterial cells), are standard
10 procedures well known in the art.

Vectors that allow expression of a nucleic acid in a cell are referred to as expression vectors. Typically, expression vectors contain a nucleic acid operably linked to at least one transcriptional regulatory sequence. Regulatory sequences are art-recognized and are selected to direct expression of the subject nucleic acids.
15 Transcriptional regulatory sequences are described in Goeddel; Gene Expression Technology: Methods in Enzymology 185, Academic Press, San Diego, CA (1990). In one embodiment, the expression vector includes a recombinant gene encoding a peptide having an agonistic activity of a subject polypeptide, or alternatively, encoding a peptide which is an antagonistic form of a subject polypeptide.

20 The choice of plasmid will depend on the type of cell in which propagation is desired and the purpose of propagation. Certain vectors are useful for amplifying and making large amounts of the desired DNA sequence. Other vectors are suitable for expression in cells in culture. Still other vectors are suitable for transfer and expression in cells in a whole animal or person. The choice of appropriate vector is
25 well within the skill of the art. Many such vectors are available commercially. The nucleic acid or full-length gene is inserted into a vector typically by means of DNA ligase attachment to a cleaved restriction enzyme site in the vector. Alternatively, the desired nucleotide sequence may be inserted by homologous recombination in vivo. Typically this is accomplished by attaching regions of homology to the vector on the
30 flanks of the desired nucleotide sequence. Regions of homology are added by ligation of oligonucleotides, or by polymerase chain reaction using primers comprising both the region of homology and a portion of the desired nucleotide sequence.

Nucleic acids or full-length genes are linked to regulatory sequences as appropriate to obtain the desired expression properties. These may include promoters (attached either at the 5' end of the sense strand or at the 3' end of the antisense strand), enhancers, terminators, operators, repressors, and inducers. The promoters
5 may be regulated or constitutive. In some situations it may be desirable to use conditionally active promoters, such as tissue-specific or developmental stage-specific promoters. These are linked to the desired nucleotide sequence using the techniques described above for linkage to vectors. Any techniques known in the art may be used.

When any of the above host cells, or other appropriate host cells or organisms,
10 are used to replicate and/or express the polynucleotides or nucleic acids of the invention, the resulting replicated nucleic acid, RNA, expressed protein or polypeptide, is within the scope of the invention as a product of the host cell or organism. The product is recovered by any appropriate means known in the art.

Once the gene corresponding to the nucleic acid is identified, its expression
15 can be regulated in the cell to which the gene is native. For example, an endogenous gene of a cell can be regulated by an exogenous regulatory sequence as disclosed in U.S. Patent No. 5,641,670, "Protein Production and Protein Delivery."

A number of vectors exist for the expression of recombinant proteins in yeast (see, for example, Broach *et al.* (1983) in *Experimental Manipulation of Gene Expression*, ed. M. Inouye, Academic Press, p. 83, incorporated by reference herein).
20 In addition, drug resistance markers such as ampicillin can be used. In an illustrative embodiment, a polypeptide is produced recombinantly utilizing an expression vector generated by sub-cloning one of the nucleic acids represented in one of SEQ ID Nos. 1-544, preferably SEQ ID Nos. 1-168, even more preferably SEQ ID Nos. 1-35, or a
25 sequence complementary thereto.

The preferred mammalian expression vectors contain both prokaryotic sequences, to facilitate the propagation of the vector in bacteria, and one or more eukaryotic transcription units that are expressed in eukaryotic cells. The various methods employed in the preparation of plasmids and transformation of host
30 organisms are well known in the art. For other suitable expression systems for both prokaryotic and eukaryotic cells, as well as general recombinant procedures, see *Molecular Cloning: A Laboratory Manual*, 2nd Ed., ed. by Sambrook, Fritsch and Maniatis (Cold Spring Harbor Laboratory Press: 1989) Chapters 16 and 17.

When it is desirable to express only a portion of a gene, e.g., a truncation mutant, it may be necessary to add a start codon (ATG) to the oligonucleotide fragment containing the desired sequence to be expressed. It is well known in the art that a methionine at the N-terminal position can be enzymatically cleaved by the use of the enzyme methionine aminopeptidase (MAP). MAP has been cloned from *E. coli* (Ben-Bassat *et al.* (1987) *J. Bacteriol.* 169:751-757) and *Salmonella typhimurium* and its *in vitro* activity has been demonstrated on recombinant proteins (Miller *et al.* (1987) *PNAS* 84:2718-1722). Therefore, removal of an N-terminal methionine, if desired, can be achieved either *in vivo* by expressing polypeptides in a host which produces MAP (e.g., *E. coli* or CM89 or *S. cerevisiae*), or *in vitro* by use of purified MAP (e.g., procedure of Miller *et al.*, *supra*).

Moreover, the nucleic acid constructs of the present invention can also be used as part of a gene therapy protocol to deliver nucleic acids such as antisense nucleic acids. Thus, another aspect of the invention features expression vectors for *in vivo* or *in vitro* transfection with an antisense oligonucleotide.

In addition to viral transfer methods, non-viral methods can also be employed to introduce a subject nucleic acid, e.g., a sequence represented by one of SEQ ID Nos. 1-544, preferably SEQ ID Nos. 1-168, even more preferably SEQ ID Nos. 1-35, or a sequence complementary thereto, into the tissue of an animal. Most nonviral methods of gene transfer rely on normal mechanisms used by mammalian cells for the uptake and intracellular transport of macromolecules. In preferred embodiments, non-viral targeting means of the present invention rely on endocytic pathways for the uptake of the subject nucleic acid by the targeted cell. Exemplary targeting means of this type include liposomal derived systems, polylysine conjugates, and artificial viral envelopes.

A nucleic acid of any of SEQ ID Nos. 1-544, preferably SEQ ID Nos. 1-168, even more preferably SEQ ID Nos. 1-35, or a sequence complementary thereto, the corresponding cDNA, or the full-length gene may be used to express the partial or complete gene product. Appropriate nucleic acid constructs are purified using standard recombinant DNA techniques as described in, for example, Sambrook *et al.*, (1989) *Molecular Cloning: A Laboratory Manual*, 2nd ed. (Cold Spring Harbor Press, Cold Spring Harbor, New York), and under current regulations described in United States Dept. of HHS, National Institute of Health (NIH) Guidelines for Recombinant

DNA Research. The polypeptides encoded by the nucleic acid may be expressed in any expression system, including, for example, bacterial, yeast, insect, amphibian and mammalian systems. Suitable vectors and host cells are described in U.S. Patent No. 5,654,173.

5 Bacteria. Expression systems in bacteria include those described in Chang *et al.*, *Nature* (1978) 275:615, Goeddel *et al.*, *Nature* (1979) 281:544; Goeddel *et al.*, *Nucleic Acids Res.* (1980) 8:4057; EP 0 036,776, U.S. Patent No. 4,551,433, DeBoer *et al.*, *Proc. Natl. Acad. Sci. (USA)* (1983) 80:2125, and Siebenlist *et al.*, *Cell* (1980) 20:269.

10 Yeast. Expression systems in yeast include those described in Hinnen *et al.*, *Proc. Natl. Acad. Sci. (USA)* (1978) 75:1929; Ito *et al.*, *J. Bacteriol.* (1983) 153:163; Kurtz *et al.*, *Mol. Cell. Biol.* (1986) 6:142; Kunze *et al.*, *J. Basic Microbiol.* (1985) 25:141; Gleeson *et al.*, *J. Gen. Microbiol.* (1986) 132:3459, Roggenkamp *et al.*, *Mol. Gen. Genet.* (1986) 202:302) Das *et al.*, *J. Bacteriol.* (1984) 158:1165; De
15 Louvencourt *et al.*, *J. Bacteriol.* (1983) 154:737, Van den Berg *et al.*, *Bio/Technology* (1990) 8:135; Kunze *et al.*, *J. Basic Microbiol.* (1985) 25:141; Cregg *et al.*, *Mol. Cell. Biol.* (1985) 5:3376, U.S. Patent Nos. 4,837,148 and 4,929,555; Beach and Nurse, *Nature* (1981) 300:706; Davidow *et al.*, *Curr. Genet.* (1985) 10:380, Gaillardin *et al.*, *Curr. Genet.* (1985) 10:49, Ballance *et al.*, *Biochem. Biophys. Res. Commun.* (1983)
20 112:284289; Tilburn *et al.*, *Gene* (1983) 26:205221, Yelton *et al.*, *Proc. Natl. Acad. Sci. (USA)* (1984) 81:14701474, Kelly and Hynes, *EMBO J.* (1985) 4:475479; EP 0 244,234, and WO 91/00357.

Insect Cells. Expression of heterologous genes in insects is accomplished as described in U.S. Patent No. 4,745,051, Friesen *et al.* (1986) "The Regulation of
25 Baculovirus Gene Expression" in: *The Molecular Biology Of Baculoviruses* (W. Doerfler, ed.), EP 0 127,839, EP 0 155,476, and Vlak *et al.*, *J. Gen. Virol.* (1988) 69:765776, Miller *et al.*, *Ann. Rev. Microbiol.* (1988) 42:177, Carbonell *et al.*, *Gene* (1988) 73:409, Maeda *et al.*, *Nature* (1985) 315:592594, LebacqzVerheyden *et al.*, *Mol. Cell. Biol.* (1988) 8:3129; Smith *et al.*, *Proc. Natl. Acad. Sci. (USA)* (1985)
30 82:8404, Miyajima *et al.*, *Gene* (1987) 58:273; and Martin *et al.*, *DNA* (1988) 7:99. Numerous baculoviral strains and variants and corresponding permissive insect host cells from hosts are described in Luckow *et al.*, *Bio/Technology* (1988) 6:4755, Miller

et al., Generic Engineering (Setlow, J.K. *et al.* eds.), Vol. 8 (Plenum Publishing, 1986), pp. 277279, and Maeda *et al.*, *Nature*, (1985) 315:592-594.

Mammalian Cells. Mammalian expression is accomplished as described in Dijkema *et al.*, *EMBO J.* (1985) 4:761, Gorman *et al.*, *Proc. Natl. Acad. Sci. (USA)*

5 (1982) 79:6777, Boshart *et al.*, *Cell* (1985) 41:521 and U.S. Patent No. 4,399,216.

Other features of mammalian expression are facilitated as described in Ham and Wallace, *Meth. Enz.* (1979) 58:44, Barnes and Sato, *Anal. Biochem.* (1980) 102:255, U.S. Patent Nos. 4,767,704, 4,657,866, 4,927,762, 4,560,655, WO 90/103430, WO 87/00195, and U.S. RE 30,985.

10

VII. Therapeutic Nucleic Acid Constructs

One aspect of the invention relates to the use of the isolated nucleic acid, e.g., SEQ ID Nos. 1-544, preferably SEQ ID Nos. 1-168, even more preferably SEQ ID Nos. 1-35, or a sequence complementary thereto, in antisense therapy. As used

15 herein, antisense therapy refers to administration or *in situ* generation of oligonucleotide molecules or their derivatives which specifically hybridize (e.g., bind) under cellular conditions with the cellular mRNA and/or genomic DNA, thereby inhibiting transcription and/or translation of that gene. The binding may be by conventional base pair complementarity, or, for example, in the case of binding to
20 DNA duplexes, through specific interactions in the major groove of the double helix. In general, antisense therapy refers to the range of techniques generally employed in the art, and includes any therapy which relies on specific binding to oligonucleotide sequences.

An antisense construct of the present invention can be delivered, for example,
25 as an expression plasmid which, when transcribed in the cell, produces RNA which is complementary to at least a unique portion of the cellular mRNA. Alternatively, the antisense construct is an oligonucleotide probe which is generated *ex vivo* and which, when introduced into the cell, causes inhibition of expression by hybridizing with the mRNA and/or genomic sequences of a subject nucleic acid. Such oligonucleotide
30 probes are preferably modified oligonucleotides which are resistant to endogenous nucleases, e.g., exonucleases and/or endonucleases, and are therefore stable *in vivo*. Exemplary nucleic acid molecules for use as antisense oligonucleotides are phosphoramidate, phosphorothioate and methylphosphonate analogs of DNA (see also

U.S. Patents 5,176,996; 5,264,564; and 5,256,775). Additionally, general approaches to constructing oligomers useful in antisense therapy have been reviewed, for example, by Van der Krol et al. (1988) *BioTechniques* 6:958-976; and Stein et al. (1988) *Cancer Res* 48:2659-2668. With respect to antisense DNA,

- 5 oligodeoxyribonucleotides derived from the translation initiation site, e.g., between the -10 and +10 regions of the nucleotide sequence of interest, are preferred.

Antisense approaches involve the design of oligonucleotides (either DNA or RNA) that are complementary to mRNA. The antisense oligonucleotides will bind to the mRNA transcripts and prevent translation. Absolute complementarity, although
10 preferred, is not required. In the case of double-stranded antisense nucleic acids, a single strand of the duplex DNA may thus be tested, or triplex formation may be assayed. The ability to hybridize will depend on both the degree of complementarity and the length of the antisense nucleic acid. Generally, the longer the hybridizing nucleic acid, the more base mismatches with an RNA it may contain and still form a
15 stable duplex (or triplex, as the case may be). One skilled in the art can ascertain a tolerable degree of mismatch by use of standard procedures to determine the melting point of the hybridized complex.

Oligonucleotides that are complementary to the 5' end of the mRNA, e.g., the 5' untranslated sequence up to and including the AUG initiation codon, should work
20 most efficiently at inhibiting translation. However, sequences complementary to the 3' untranslated sequences of mRNAs have recently been shown to be effective at inhibiting translation of mRNAs as well. (Wagner, R. 1994. *Nature* 372:333). Therefore, oligonucleotides complementary to either the 5' or 3' untranslated, non-coding regions of a gene could be used in an antisense approach to inhibit translation
25 of endogenous mRNA. Oligonucleotides complementary to the 5' untranslated region of the mRNA should include the complement of the AUG start codon. Antisense oligonucleotides complementary to mRNA coding regions are typically less efficient inhibitors of translation but could also be used in accordance with the invention. Whether designed to hybridize to the 5', 3', or coding region of subject mRNA,
30 antisense nucleic acids should be at least six nucleotides in length, and are preferably less than about 100 and more preferably less than about 50, 25, 17 or 10 nucleotides in length.

Regardless of the choice of target sequence, it is preferred that *in vitro* studies are first performed to quantitate the ability of the antisense oligonucleotide to quantitate the ability of the antisense oligonucleotide to inhibit gene expression. It is preferred that these studies utilize controls that distinguish between antisense gene inhibition and nonspecific biological effects of oligonucleotides. It is also preferred that these studies compare levels of the target RNA or protein with that of an internal control RNA or protein. Additionally, it is envisioned that results obtained using the antisense oligonucleotide are compared with those obtained using a control oligonucleotide. It is preferred that the control oligonucleotide is of approximately the same length as the test oligonucleotide and that the nucleotide sequence of the oligonucleotide differs from the antisense sequence no more than is necessary to prevent specific hybridization to the target sequence.

The oligonucleotides can be DNA or RNA or chimeric mixtures or derivatives or modified versions thereof, single-stranded or double-stranded. The oligonucleotide can be modified at the base moiety, sugar moiety, or phosphate backbone, for example, to improve stability of the molecule, hybridization, etc. The oligonucleotide may include other appended groups such as peptides (e.g., for targeting host cell receptors), or agents facilitating transport across the cell membrane (see, e.g., Letsinger et al., 1989, Proc. Natl. Acad. Sci. U.S.A. 86:6553-6556; Lemaitre et al., 1987, Proc. Natl. Acad. Sci. 84:648-652; PCT Publication No. WO 88/09810, published December 15, 1988) or the blood-brain barrier (see, e.g., PCT Publication No. WO 89/10134, published April 25, 1988), hybridization-triggered cleavage agents (See, e.g., Krol et al., 1988, BioTechniques 6:958-976), or intercalating agents (See, e.g., Zon, 1988, Pharm. Res. 5:539-549). To this end, the oligonucleotide may be conjugated to another molecule, e.g., a peptide, hybridization triggered cross-linking agent, transport agent, hybridization-triggered cleavage agent, etc.

The antisense oligonucleotide may comprise at least one modified base moiety which is selected from the group including but not limited to 5-fluorouracil, 5-bromouracil, 5-chlorouracil, 5-iodouracil, hypoxanthine, xantine, 4-acetylcytosine, 5-(carboxyhydroxytriethyl) uracil, 5-carboxymethylaminomethyl-2-thiouridine, 5-carboxymethylaminomethyluracil, dihydrouracil, beta-D-galactosylqueosine, inosine, N6-isopentenyladenine, 1-methylguanine, 1-methylinosine, 2,2-dimethylguanine, 2-methyladenine, 2-methylguanine, 3-methylcytosine, 5-methylcytosine, N6-adenine,

7-methylguanine, 5-methylaminomethyluracil, 5-methoxyaminomethyl-2-thiouracil, beta-D-mannosylqueosine, 5-methoxycarboxymethyluracil, 5-methoxyuracil, 2-methylthio-N6-isopentenyladenine, uracil-5-oxyacetic acid (v), wybutoxosine, pseudouracil, queosine, 2-thiocytosine, 5-methyl-2-thiouracil, 2-thiouracil, 4-thiouracil, 5-methyluracil, uracil-5-oxyacetic acid methylester, uracil-5-oxyacetic acid (v), 5-methyl-2-thiouracil, 3-(3-amino-3-N-2-carboxypropyl) uracil, (acp3)w, and 2,6-diaminopurine.

The antisense oligonucleotide may also comprise at least one modified sugar moiety selected from the group including but not limited to arabinose, 2-fluoroarabinose, xylulose, and hexose.

The antisense oligonucleotide can also contain a neutral peptide-like backbone. Such molecules are termed peptide nucleic acid (PNA)-oligomers and are described, e.g., in Perry- O'Keefe et al. (1996) Proc. Natl. Acad. Sci. U.S.A. 93:14670 and in Eglom *et al.* (1993) Nature 365:566. One advantage of PNA oligomers is their capability to bind to complementary DNA essentially independently from the ionic strength of the medium due to the neutral backbone of the DNA. In yet another embodiment, the antisense oligonucleotide comprises at least one modified phosphate backbone selected from the group consisting of a phosphorothioate, a phosphorodithioate, a phosphoramidothioate, a phosphoramidate, a phosphordiamidate, a methylphosphonate, an alkyl phosphotriester, and a formacetal or analog thereof.

In yet a further embodiment, the antisense oligonucleotide is an α -anomeric oligonucleotide. An α -anomeric oligonucleotide forms specific double-stranded hybrids with complementary RNA in which, contrary to the usual β -units, the strands run parallel to each other (Gautier et al., 1987, Nucl. Acids Res. 15:6625-6641). The oligonucleotide is a 2'-O-methylribonucleotide (Inoue et al., 1987, Nucl. Acids Res. 15:6131-12148), or a chimeric RNA-DNA analogue (Inoue et al., 1987, FEBS Lett. 215:327-330).

Oligonucleotides of the invention may be synthesized by standard methods known in the art, e.g., by use of an automated DNA synthesizer (such as are commercially available from Biosearch, Applied Biosystems, etc.). As examples, phosphorothioate oligonucleotides may be synthesized by the method of Stein et al. (1988, Nucl. Acids Res. 16:3209), methylphosphonate oligonucleotides can be

prepared by use of controlled pore glass polymer supports (Sarin et al., 1988, Proc. Natl. Acad. Sci. U.S.A. 85:7448-7451), etc.

While antisense nucleotides complementary to a coding region sequence can be used, those complementary to the transcribed untranslated region and to the region
5 comprising the initiating methionine are most preferred.

The antisense molecules can be delivered to cells which express the target nucleic acid *in vivo*. A number of methods have been developed for delivering antisense DNA or RNA to cells; e.g., antisense molecules can be injected directly into the tissue site, or modified antisense molecules, designed to target the desired cells
10 (e.g., antisense linked to peptides or antibodies that specifically bind receptors or antigens expressed on the target cell surface) can be administered systemically.

However, it is often difficult to achieve intracellular concentrations of the antisense sufficient to suppress translation on endogenous mRNAs. Therefore, a preferred approach utilizes a recombinant DNA construct in which the antisense
15 oligonucleotide is placed under the control of a strong pol III or pol II promoter. The use of such a construct to transfect target cells in the patient will result in the transcription of sufficient amounts of single stranded RNAs that will form complementary base pairs with the endogenous transcripts and thereby prevent translation of the target mRNA. For example, a vector can be introduced *in vivo* such
20 that it is taken up by a cell and directs the transcription of an antisense RNA. Such a vector can remain episomal or become chromosomally integrated, as long as it can be transcribed to produce the desired antisense RNA. Such vectors can be constructed by recombinant DNA technology methods standard in the art. Vectors can be plasmid, viral, or others known in the art for replication and expression in mammalian cells.
25 Expression of the sequence encoding the antisense RNA can be by any promoter known in the art to act in mammalian, preferably human cells. Such promoters can be inducible or constitutive. Such promoters include but are not limited to: the SV40 early promoter region (Bernoist and Chambon, 1981, Nature 290:304-310), the promoter contained in the 3' long terminal repeat of Rous sarcoma virus (Yamamoto
30 *et al.*, 1980, Cell 22:787-797), the herpes thymidine kinase promoter (Wagner et al., 1981, Proc. Natl. Acad. Sci. U.S.A. 78:1441-1445), the regulatory sequences of the metallothionein gene (Brinster et al, 1982, Nature 296:39-42), etc. Any type of plasmid, cosmid, YAC or viral vector can be used to prepare the recombinant DNA

construct which can be introduced directly into the tissue site; e.g., the choroid plexus or hypothalamus. Alternatively, viral vectors can be used which selectively infect the desired tissue (e.g., for brain, herpesvirus vectors may be used), in which case administration may be accomplished by another route (e.g., systemically).

5 In another aspect of the invention, ribozyme molecules designed to catalytically cleave target mRNA transcripts can be used to prevent translation of target mRNA and expression of a target protein (See, e.g., PCT International Publication WO90/11364, published October 4, 1990; Sarver *et al.*, 1990, Science 247:1222-1225 and U.S. Patent No. 5,093,246). While ribozymes that cleave mRNA
10 at site specific recognition sequences can be used to destroy target mRNAs, the use of hammerhead ribozymes is preferred. Hammerhead ribozymes cleave mRNAs at locations dictated by flanking regions that form complementary base pairs with the target mRNA. The sole requirement is that the target mRNA have the following sequence of two bases: 5'-UG-3'. The construction and production of hammerhead
15 ribozymes is well known in the art and is described more fully in Haseloff and Gerlach, 1988, Nature, 334:585-591. Preferably the ribozyme is engineered so that the cleavage recognition site is located near the 5' end of the target mRNA; i.e., to increase efficiency and minimize the intracellular accumulation of non-functional mRNA transcripts.

20 The ribozymes of the present invention also include RNA endoribonucleases (hereinafter "Cech-type ribozymes") such as the one which occurs naturally in *Tetrahymena thermophila* (known as the IVS, or L-19 IVS RNA) and which has been extensively described by Thomas Cech and collaborators (Zaug, et al., 1984, Science, 224:574-578; Zaug and Cech, 1986, Science, 231:470-475; Zaug, et al., 1986, Nature,
25 324:429-433; published International patent application No. WO88/04300 by University Patents Inc.; Been and Cech, 1986, Cell, 47:207-216). The Cech-type ribozymes have an eight base pair active site which hybridizes to a target RNA sequence whereafter cleavage of the target RNA takes place. The invention encompasses those Cech-type ribozymes which target eight base-pair active site
30 sequences that are present in a target gene.

As in the antisense approach, the ribozymes can be composed of modified oligonucleotides (e.g., for improved stability, targeting, etc.) and should be delivered to cells which express the target gene *in vivo*. A preferred method of delivery

involves using a DNA construct "encoding" the ribozyme under the control of a strong constitutive pol III or pol II promoter, so that transfected cells will produce sufficient quantities of the ribozyme to destroy endogenous messages and inhibit translation. Because ribozymes, unlike antisense molecules, are catalytic, a lower intracellular concentration is required for efficiency.

Antisense RNA, DNA, and ribozyme molecules of the invention may be prepared by any method known in the art for the synthesis of DNA and RNA molecules. These include techniques for chemically synthesizing oligodeoxyribonucleotides and oligoribonucleotides well known in the art such as for example solid phase phosphoramidite chemical synthesis. Alternatively, RNA molecules may be generated by *in vitro* and *in vivo* transcription of DNA sequences encoding the antisense RNA molecule. Such DNA sequences may be incorporated into a wide variety of vectors which incorporate suitable RNA polymerase promoters such as the T7 or SP6 polymerase promoters. Alternatively, antisense cDNA constructs that synthesize antisense RNA constitutively or inducibly, depending on the promoter used, can be introduced stably into cell lines.

Moreover, various well-known modifications to nucleic acid molecules may be introduced as a means of increasing intracellular stability and half-life. Possible modifications include but are not limited to the addition of flanking sequences of ribonucleotides or deoxyribonucleotides to the 5' and/or 3' ends of the molecule or the use of phosphorothioate or 2' O-methyl rather than phosphodiesterase linkages within the oligodeoxyribonucleotide backbone.

VIII. Polypeptides of the Present Invention

The present invention makes available isolated polypeptides which are isolated from, or otherwise substantially free of other cellular proteins, especially other signal transduction factors and/or transcription factors which may normally be associated with the polypeptide. Subject polypeptides of the present invention include polypeptides encoded by the nucleic acids of SEQ ID Nos. 1-544, preferably SEQ ID Nos. 1-168, even more preferably SEQ ID Nos. 1-35, or a sequence complementary thereto, or polypeptides encoded by genes of which a sequence in SEQ ID Nos. 1-544, preferably SEQ ID Nos. 1-168, even more preferably SEQ ID Nos. 1-35, or a sequence complementary thereto, is a fragment. Polypeptides of the present invention

include those proteins which are differentially regulated in tumor cells, especially colon cancer-derived cell lines (relative to normal cells, e.g., normal colon tissue and non-colon tissue). In preferred embodiments, the polypeptides are upregulated in tumor cells, especially colon cancer cancer-derived cell lines. In other embodiments, the polypeptides are downregulated in tumor cells, especially colon cancer-derived cell lines. Proteins which are upregulated, such as oncogenes, or downregulated, such as tumor suppressors, in aberrantly proliferating cells may be targets for diagnostic or therapeutic techniques. For example, upregulation of the *cdc2* gene induces mitosis. Overexpression of the *myt1* gene, a mitotic deactivator, negatively regulates the activity of *cdc2*. Aberrant proliferation may thus be induced either by upregulating *cdc2* or by downregulating *myt1*.

The term "substantially free of other cellular proteins" (also referred to herein as "contaminating proteins") or "substantially pure or purified preparations" are defined as encompassing preparations of polypeptides having less than about 20% (by dry weight) contaminating protein, and preferably having less than about 5% contaminating protein. Functional forms of the subject polypeptides can be prepared, for the first time, as purified preparations by using a cloned nucleic acid as described herein. Full length proteins or fragments corresponding to one or more particular motifs and/or domains or to arbitrary sizes, for example, at least about 5, 10, 25, 50, 75, or 100 amino acids in length are within the scope of the present invention.

For example, isolated polypeptides can be encoded by all or a portion of a nucleic acid sequence shown in any of SEQ ID Nos. 1-544, preferably SEQ ID Nos. 1-168, even more preferably SEQ ID Nos. 1-35, or a sequence complementary thereto. Isolated peptidyl portions of proteins can be obtained by screening peptides recombinantly produced from the corresponding fragment of the nucleic acid encoding such peptides. In addition, fragments can be chemically synthesized using techniques known in the art such as conventional Merrifield solid phase f-Moc or t-Boc chemistry. For example, a polypeptide of the present invention may be arbitrarily divided into fragments of desired length with no overlap of the fragments, or preferably divided into overlapping fragments of a desired length. The fragments can be produced (recombinantly or by chemical synthesis) and tested to identify those peptidyl fragments which can function as either agonists or antagonists of a wild-type (e.g., "authentic") protein.

Another aspect of the present invention concerns recombinant forms of the subject proteins. Recombinant polypeptides preferred by the present invention, in addition to native proteins, as described above are encoded by a nucleic acid, which is at least 60%, more preferably at least 80%, and more preferably 85%, and more preferably 90%, and more preferably 95% identical to an amino acid sequence encoded by SEQ ID Nos. 1-544. Polypeptides which are encoded by a nucleic acid that is at least about 98-99% identical with the sequence of SEQ ID Nos. 1-544 are also within the scope of the invention. Also included in the present invention are peptide fragments comprising at least a portion of such a protein.

10 In a preferred embodiment, a polypeptide of the present invention is a mammalian polypeptide and even more preferably a human polypeptide. In particularly preferred embodiment, the polypeptide retains wild-type bioactivity. It will be understood that certain post-translational modifications, e.g., phosphorylation and the like, can increase the apparent molecular weight of the polypeptide relative to the unmodified polypeptide chain.

The present invention further pertains to recombinant forms of one of the subject polypeptides. Such recombinant polypeptides preferably are capable of functioning in one of either role of an agonist or antagonist of at least one biological activity of a wild-type ("authentic") polypeptide of the appended sequence listing. The term "evolutionarily related to", with respect to amino acid sequences of proteins, refers to both polypeptides having amino acid sequences which have arisen naturally, and also to mutational variants of human polypeptides which are derived, for example, by combinatorial mutagenesis.

In general, polypeptides referred to herein as having an activity (e.g., are "bioactive") of a protein are defined as polypeptides which include an amino acid sequence encoded by all or a portion of the nucleic acid sequences shown in one of SEQ ID Nos. 1-544, preferably SEQ ID Nos. 1-168, even more preferably SEQ ID Nos. 1-35, or a sequence complementary thereto, and which mimic or antagonize all or a portion of the biological/biochemical activities of a naturally occurring protein.

30 According to the present invention, a polypeptide has biological activity if it is a specific agonist or antagonist of a naturally occurring form of a protein.

Assays for determining whether a compound, e.g., a protein or variant thereof, has one or more of the above biological activities are well known in the art. In certain

embodiments, the polypeptides of the present invention have activities such as those outlined above.

In another embodiment, the coding sequences for the polypeptide can be incorporated as a part of a fusion gene including a nucleotide sequence encoding a different polypeptide. This type of expression system can be useful under conditions where it is desirable to produce an immunogenic fragment of a polypeptide (see, for example, EP Publication No: 0259149; and Evans *et al.* (1989) *Nature* 339:385; Huang *et al.* (1988) *J. Virol.* 62:3855; and Schlienger *et al.* (1992) *J. Virol.* 66:2). In addition to utilizing fusion proteins to enhance immunogenicity, it is widely appreciated that fusion proteins can also facilitate the expression of proteins, and, accordingly, can be used in the expression of the polypeptides of the present invention (see, for example, *Current Protocols in Molecular Biology*, eds. Ausubel *et al.* (N.Y.: John Wiley & Sons, 1991)). In another embodiment, a fusion gene coding for a purification leader sequence, such as a poly-(His)/enterokinase cleavage site sequence at the N-terminus of the desired portion of the recombinant protein, can allow purification of the expressed fusion protein by affinity chromatography using a Ni²⁺ metal resin. The purification leader sequence can then be subsequently removed by treatment with enterokinase to provide the purified protein (e.g., see Hochuli *et al.* (1987) *J. Chromatography* 411:177; and Janknecht *et al.* *PNAS* 88:8972).

Techniques for making fusion genes are known to those skilled in the art. Essentially, the joining of various DNA fragments coding for different polypeptide sequences is performed in accordance with conventional techniques, employing blunt-ended or stagger-ended termini for ligation, restriction enzyme digestion to provide for appropriate termini, filling-in of cohesive ends as appropriate, alkaline phosphatase treatment to avoid undesirable joining, and enzymatic ligation. In another embodiment, the fusion gene can be synthesized by conventional techniques including automated DNA synthesizers. Alternatively, PCR amplification of nucleic acid fragments can be carried out using anchor primers which give rise to complementary overhangs between two consecutive nucleic acid fragments which can subsequently be annealed to generate a chimeric nucleic acid sequence (see, for example, *Current Protocols in Molecular Biology*, eds. Ausubel *et al.* John Wiley & Sons: 1992).

The present invention further pertains to methods of producing the subject polypeptides. For example, a host cell transfected with a nucleic acid vector directing

expression of a nucleotide sequence encoding the subject polypeptides can be cultured under appropriate conditions to allow expression of the peptide to occur. Suitable media for cell culture are well known in the art. The recombinant polypeptide can be isolated from cell culture medium, host cells, or both using techniques known in the art for purifying proteins including ion-exchange chromatography, gel filtration chromatography, ultrafiltration, electrophoresis, and immunoaffinity purification with antibodies specific for such peptide. In a preferred embodiment, the recombinant polypeptide is a fusion protein containing a domain which facilitates its purification, such as GST fusion protein.

Moreover, it will be generally appreciated that, under certain circumstances, it may be advantageous to provide homologs of one of the subject polypeptides which function in a limited capacity as one of either an agonist (mimetic) or an antagonist, in order to promote or inhibit only a subset of the biological activities of the naturally occurring form of the protein. Thus, specific biological effects can be elicited by treatment with a homolog of limited function, and with fewer side effects relative to treatment with agonists or antagonists which are directed to all of the biological activities of naturally occurring forms of subject proteins.

Homologs of each of the subject polypeptide can be generated by mutagenesis, such as by discrete point mutation(s), or by truncation. For instance, mutation can give rise to homologs which retain substantially the same, or merely a subset, of the biological activity of the polypeptide from which it was derived. Alternatively, antagonistic forms of the polypeptide can be generated which are able to inhibit the function of the naturally occurring form of the protein, such as by competitively binding to a receptor.

The recombinant polypeptides of the present invention also include homologs of the wild-type proteins, such as versions of those proteins which are resistant to proteolytic cleavage, for example, due to mutations which alter ubiquitination or other enzymatic targeting associated with the protein.

Polypeptides may also be chemically modified to create derivatives by forming covalent or aggregate conjugates with other chemical moieties, such as glycosyl groups, lipids, phosphate, acetyl groups and the like. Covalent derivatives of proteins can be prepared by linking the chemical moieties to functional groups on

amino acid sidechains of the protein or at the N-terminus or at the C-terminus of the polypeptide.

Modification of the structure of the subject polypeptides can be for such purposes as enhancing therapeutic or prophylactic efficacy, stability (e.g., *ex vivo* shelf life and resistance to proteolytic degradation), or post-translational modifications (e.g., to alter phosphorylation pattern of protein). Such modified peptides, when designed to retain at least one activity of the naturally occurring form of the protein, or to produce specific antagonists thereof, are considered functional equivalents of the polypeptides described in more detail herein. Such modified peptides can be produced, for instance, by amino acid substitution, deletion, or addition. The substitutional variant may be a substituted conserved amino acid or a substituted non-conserved amino acid.

For example, it is reasonable to expect that an isolated replacement of a leucine with an isoleucine or valine, an aspartate with a glutamate, a threonine with a serine, or a similar replacement of an amino acid with a structurally related amino acid (i.e., isosteric and/or isoelectric mutations) will not have a major effect on the biological activity of the resulting molecule. Conservative replacements are those that take place within a family of amino acids that are related in their side chains.

Genetically encoded amino acids can be divided into four families: (1) acidic = aspartate, glutamate; (2) basic = lysine, arginine, histidine; (3) nonpolar = alanine, valine, leucine, isoleucine, proline, phenylalanine, methionine, tryptophan; and (4) uncharged polar = glycine, asparagine, glutamine, cysteine, serine, threonine, tyrosine. In similar fashion, the amino acid repertoire can be grouped as (1) acidic = aspartate, glutamate; (2) basic = lysine, arginine histidine, (3) aliphatic = glycine, alanine, valine, leucine, isoleucine, serine, threonine, with serine and threonine optionally be grouped separately as aliphatic-hydroxyl; (4) aromatic = phenylalanine, tyrosine, tryptophan; (5) amide = asparagine, glutamine; and (6) sulfur -containing = cysteine and methionine. (see, for example, Biochemistry, 2nd ed., Ed. by L. Stryer, WH Freeman and Co.: 1981). Whether a change in the amino acid sequence of a peptide results in a functional homolog (e.g., functional in the sense that the resulting polypeptide mimics or antagonizes the wild-type form) can be readily determined by assessing the ability of the variant peptide to produce a response in cells in a fashion similar to the wild-type protein, or competitively inhibit such a response.

Polypeptides in which more than one replacement has taken place can readily be tested in the same manner. The variant may be designed so as to retain biological activity of a particular region of the protein. In a non-limiting example, Osawa et al., 1994, Biochemistry and Molecular International 34:1003-1009, discusses the actin binding region of a protein from several different species. The actin binding regions of these species are considered homologous based on the fact that they have amino acids that fall within "homologous residue groups." Homologous residues are judged according to the following groups (using single letter amino acid designations): STAG; ILVMF; HRK; DEQN; and FYW. For example, an S, a T, an A or a G can be in a position and the function (in this case actin binding) is retained.

Additional guidance on amino acid substitution is available from studies of protein evolution. Go et al., 1980, Int. J. Peptide Protein Res. 15:211-224, classified amino acid residue sites as interior or exterior depending on their accessibility. More frequent substitution on exterior sites was confirmed to be general in eight sets of homologous protein families regardless of their biological functions and the presence or absence of a prosthetic group. Virtually all types of amino acid residues had higher mutabilities on the exterior than in the interior. No correlation between mutability and polarity was observed of amino acid residues in the interior and exterior, respectively. Amino acid residues were classified into one of three groups depending on their polarity: polar (Arg, Lys, His, Gln, Asn, Asp, and Glu); weak polar (Ala, Pro, Gly, Thr, and Ser), and nonpolar (Cys, Val, Met, Ile, Leu, Phe, Tyr, and Trp). Amino acid replacements during protein evolution were very conservative: 88% and 76% of them in the interior or exterior, respectively, were within the same group of the three. Inter-group replacements are such that weak polar residues are replaced more often by nonpolar residues in the interior and more often by polar residues on the exterior.

Querol et al., 1996, Prot. Eng. 9:265-271, provides general rules for amino acid substitutions to enhance protein thermostability. New glycosylation sites can be introduced as discussed in Olsen and Thomsen, 1991, J. Gen. Microbiol. 137:579-585. An additional disulfide bridge can be introduced, as discussed by Perry and Wetzel, 1984, Science 226:555-557; Pantoliano et al., 1987, Biochemistry 26:2077-2082; Matsumura et al., 1989, Nature 342:291-293; Nishikawa et al., 1990, Protein Eng. 3:443-448; Takagi et al., 1990, J. Biol. Chem. 265:6874-6878; Clarke et al., 1993, Biochemistry 32:4322-4329; and Wakarchuk et al., 1994, Protein Eng. 7:1379-1386.

An additional metal binding site can be introduced, according to Toma et al., 1991, Biochemistry 30:97-106, and Haezebrouck et al., 1993, Protein Eng. 6:643-649. Substitutions with prolines in loops can be made according to Masul et al., 1994, Appl. Env. Microbiol. 60:3579-3584; and Hardy et al., FEBS Lett. 317:89-92.

5 Cysteine-depleted muteins are considered variants within the scope of the invention. These variants can be constructed according to methods disclosed in U.S. Patent No. 4,959,314, which discloses how to substitute other amino acids for cysteines, and how to determine biological activity and effect of the substitution. Such methods are suitable for proteins according to this invention that have cysteine
10 residues suitable for such substitutions, for example to eliminate disulfide bond formation.

To learn the identity and function of the gene that correlates with an nucleic acid, the nucleic acids or corresponding amino acid sequences can be screened against profiles of protein families. Such profiles focus on common structural motifs among
15 proteins of each family. Publicly available profiles are described above. Additional or alternative profiles are described below.

In comparing a new nucleic acid with known sequences, several alignment tools are available. Examples include PileUp, which creates a multiple sequence alignment, and is described in Feng *et al.*, *J. Mol. Evol.* (1987) 25:351-360. Another
20 method, GAP, uses the alignment method of Needleman *et al.*, *J. Mol. Biol.* (1970) 48:443-453. GAP is best suited for global alignment of sequences. A third method, BestFit, functions by inserting gaps to maximize the number of matches using the local homology algorithm of Smith and Waterman, *Adv. Appl. Math.* (1981) 2:482-489.

25 Examples of such profiles are described below.

Chemokines

Chemokines are a family of proteins that have been implicated in lymphocyte trafficking, inflammatory diseases, angiogenesis, hematopoiesis, and viral infection.
30 See, for example, Rollins, *Blood* (1997) 90(3):909-928, and Wells *et al.*, *J. Leuk. Biol.* (1997) 61:545-550. U.S. Patent No. 5,605,817 discloses DNA encoding a chemokine expressed in fetal spleen. U.S. Patent No. 5,656,724 discloses chemokine-like

proteins and methods of use. U.S. Patent No. 5,602,008 discloses DNA encoding a chemokine expressed by liver.

5 Mutants of the encoded chemokines are polypeptides having an amino acid sequence that possesses at least one amino acid substitution, addition, or deletion as compared to native chemokines. Fragments possess the same amino acid sequence of the native chemokines; mutants may lack the amino and/or carboxyl terminal sequences. Fusions are mutants, fragments, or the native chemokines that also include amino and/or carboxyl terminal amino acid extensions.

10 The number or type of the amino acid changes is not critical, nor is the length or number of the amino acid deletions, or amino acid extensions that are incorporated in the chemokines as compared to the native chemokine amino acid sequences. A polynucleotide encoding one of these variant polypeptides will retain at least about 80% amino acid identity with at least one known chemokine. Preferably, these polypeptides will retain at least about 85% amino acid sequence identity, more
15 preferably, at least about 90%; even more preferably, at least about 95%. In addition, the variants will exhibit at least 80%; preferably about 90%; more preferably about 95% of at least one activity exhibited by a native chemokine. Chemokine activity includes immunological, biological, receptor binding, and signal transduction functions of the native chemokine.

20 Chemotaxis. Assays for chemotaxis relating to neutrophils are described in Walz *et al.*, *Biochem. Biophys. Res. Commun.* (1987) 149:755, Yoshimura *et al.*, *Proc. Natl. Acad. Sci. (USA)* (1987) 84:9233, and Schroder *et al.*, *J. Immunol.* (1987) 139:3474; to lymphocytes, Larsen *et al.*, *Science* (1989) 243:1464, Carr *et al.*, *Proc. Natl. Acad. Sci. (USA)* (1994) 91:3652; to tumor-infiltrating lymphocytes, Liao *et al.*,
25 *J. Exp. Med* (1995). 182:1301; to hemopoietic progenitors, Aiuti *et al.*, *J. Exp. Med.* (1997) 185:111; to monocytes, Valente *et al.*, *Biochem.* (1988) 27:4162; and to natural killer cells, Loetscher *et al.*, *J. Immunol.* (1996) 156:322, and Allavena *et al.*, *Eur. J. Immunol.* (1994) 24:3233.

30 Assays for determining the biological activity of attracting eosinophils are described in Dahinden *et al.*, *J. Exp. Med.* (1994) 179:751, Weber *et al.*, *J. Immunol.* (1995) 154:4166, and Noso *et al.*, *Biochem. Biophys. Res. Commun.* (1994) 200:1470; for attracting dendritic cells, Sozzani *et al.*, *J. Immunol.* (1995) 155:3292; for attracting basophils, in Dahinden *et al.*, *J. Exp. Med.* (1994) 179:751, Alam *et al.*, *J.*

Immunol. (1994) 152:1298, Alam *et al.*, *J. Exp. Med.* (1992) 176:781; and for activating neutrophils, Maghazaci *et al.*, *Eur. J. Immunol.* (1996) 26:315, and Taub *et al.*, *J. Immunol.* (1995) 155:3877. Native chemokines can act as mitogens for fibroblasts, assayed as described in Mullenbach *et al.*, *J. Biol. Chem.* (1986) 261:719.

5 Receptor Binding. Native chemokines exhibit binding activity with a number of receptors. Description of such receptors and assays to detect binding are described in, for example, Murphy *et al.*, *Science* (1991) 253:1280; Combadiere *et al.*, *J. Biol. Chem.* (1995) 270:29671; Daugherty *et al.*, *J. Exp. Med.* (1996) 183:2349; Samson *et al.*, *Biochem.* (1996) 35:3362; Raport *et al.*, *J. Biol. Chem.* (1996) 271:17161; 10 Combadiere *et al.*, *J. Leukoc. Biol.* (1996) 60:147; Baba *et al.*, *J. Biol. Chem.* (1997) 272:14893; Yosida *et al.*, *J. Biol. Chem.* (1997) 272:13803; Arvanitakis *et al.*, *Nature* (1997) 385:347, and many other assays are known in the art.

Kinase Activation. Assays for kinase activation are described by Yen *et al.*, *J. Leukoc. Biol.* (1997) 61:529; Dubois *et al.*, *J. Immunol.* (1996) 156:1356; Turner *et al.*, *J. Immunol.* (1995) 155:2437. Assays for inhibition of angiogenesis or cell 15 proliferation are described in Maione *et al.*, *Science* (1990) 247:77.

Glycosaminoglycan production can be induced by native chemokines, assayed as described in Castor *et al.*, *Proc. Natl. Acad. Sci. (USA)* (1983) 80:765. Chemokine-mediated histamine release from basophils is assayed as described in Dahinden *et al.*, 20 *J. Exp. Med.* (1989) 170:1787; and White *et al.*, *Immunol. Lett.* (1989) 22:151. Heparin binding is described in Luster *et al.*, *J. Exp. Med.* (1995) 182:219.

Dimerization Activity. Chemokines can possess dimerization activity, which can be assayed according to Burrows *et al.*, *Biochem.* (1994) 33:12741; and Zhang *et al.*, *Mol. Cell. Biol.* (1995) 15:4851. Native chemokines can play a role in the 25 inflammatory response of viruses. This activity can be assayed as described in Bleul *et al.*, *Nature* (1996) 382:829; and Oberlin *et al.*, *Nature* (1996) 382:833. Exocytosis of monocytes can be promoted by native chemokines. The assay for such activity is described in Ugucioni *et al.*, *Eur. J. Immunol.* (1995) 25:64. Native chemokines also can inhibit hemopoietic stem cell proliferation. The method for testing for such 30 activity is reported in Graham *et al.*, *Nature* (1990) 344:442.

Death Domain Proteins Several protein families contain death domain motifs (Feinstein and Kimchi, *TIBS Letters* (1995) 20:242-244). Some death domain-containing proteins are implicated in cytotoxic intracellular signaling (Cleveland and

Ihle, *Cell* (1995) 81:479-482, Pan *et al*, *Science* (1997) 276:111-113, Duan and Dixit, *Nature* (1997) 385:86-89, and Chinnaiyan *et al*, *Science* (1996) 274:990-992). U.S. Patent No. 5,563,039 describes a protein homologous to TRADD (Tumor Necrosis Factor Receptor-1 Associated Death Domain containing protein), and modifications of the active domain of TRADD that retain the functional characteristics of the protein, as well as apoptosis assays for testing the function of such death domain containing proteins. U.S. Patent No. 5,658,883 discloses biologically active TGF-B1 peptides. U.S. Patent No. 5,674,734 discloses protein RIP which contains a C-terminal death domain and an N-terminal kinase domain.

10 Leukemia Inhibitory Factor (LIF) An LIF profile is constructed from sequences of leukemia inhibitor factor, CT-1 (cardiotrophin-1), CNTF (ciliary neurotrophic factor), OSM (oncostatin M), and IL-6 (interleukin-6). This profile encompasses a family of secreted cytokines that have pleiotropic effects on many cell types including hepatocytes, osteoclasts, neuronal cells and cardiac myocytes, and can be used to detect additional genes encoding such proteins. These molecules are all structurally related and share a common co-receptor gp130 which mediates intracellular signal transduction by cytoplasmic tyrosine kinases such as src.

Novel proteins related to this family are also likely to be secreted, to activate gp130 and to function in the development of a variety of cell types. Thus new members of this family would be candidates to be developed as growth or survival factors for the cell types that they stimulate. For more details on this family of cytokines, see Pennica *et al*, *Cytokine and Growth Factor Reviews* (1996) 7:81-91. U.S. Patent No. 5,420,247 discloses LIF receptor and fusion proteins. U.S. Patent No. 5,443,825 discloses human LIF.

25 Angiopoietin Angiopoietin-1 is a secreted ligand of the TIE-2 tyrosine kinase; it functions as an angiogenic factor critical for normal vascular development. Angiopoietin-2 is a natural antagonist of angiopoietin-1 and thus functions as an anti-angiogenic factor. These two proteins are structurally similar and activate the same receptor. (Folkman and D'Amore, *Cell* (1996) 87:1153-1155, and Davis *et al.*, *Cell* (1996) 87:1161-1169.)

30 The angiopoietin molecules are composed of two domains, a coiled-coil region and a region related to fibrinogen. The fibrinogen domain is found in many molecules including ficolin and tesascin, and is well defined structurally with many members.

Receptor Protein-Tyrosine Kinases Receptor Protein-Tyrosine Kinases or RPTKs are described in Lindberg, *Annu. Rev. Cell Biol.* (1994) 10:251-337.

Growth Factors: Epidermal Growth Factor (EGF) and Fibroblast Growth Factor (FGF)

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For a discussion of growth factor superfamilies, see Growth Factors: A Practical Approach, Appendix A1 (Ed. McKay and Leigh, Oxford University Press, NY, 1993) pp. 237-243.

The alignments (pretty box) for EGF and FGF are shown in Figures 1 and 2, respectively. U.S. Patent No. 4,444,760 discloses acidic brain fibroblast growth factor, which is active in the promotion of cell division and wound healing. U.S. Patent No. 5,439,818 discloses DNA encoding human recombinant basic fibroblast growth factor, which is active in wound healing. U.S. Patent No. 5,604,293 discloses recombinant human basic fibroblast growth factor, which is useful for wound healing. U.S. Patent No. 5,410,832 discloses brain-derived and recombinant acidic fibroblast growth factor, which act as mitogens for mesoderm and neuroectoderm-derived cells in culture, and promote wound healing in soft tissue, cartilaginous tissue and musculo-skeletal tissue. U.S. Patent No. 5,387,673 discloses biologically active fragments of FGF that retain activity.

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Proteins of the TNF Family A profile derived from the TNF family is created by aligning sequences of the following TNF family members: nerve growth factor (NGF), lymphotoxin, Fas ligand, tumor necrosis factor (TNF), CD40 ligand, TRAIL, ox40 ligand, 4-1BB ligand, CD27 ligand, and CD30 ligand. The profile is designed to identify sequences of proteins that constitute new members or homologues of this family of proteins.

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U.S. Patent No. 5,606,023 discloses mutant TNF proteins; U.S. Patent No. 5,597,899 and U.S. Patent No. 5,486,463 disclose TNF muteins; and U.S. Patent No. 5,652,353 discloses DNA encoding TNF- α muteins.

Members of the TNF family of proteins have been shown in vitro to multimerize, as described in Burrows *et al.*, *Biochem.* (1994) 33:12741 and Zhang *et al.*, *Mol. Cell. Biol.* (1995) 15:4851 and bind receptors as described in Browning *et al.*, *J. Immunol.* (1994) 147:1230, Androlewicz *et al.*, *J. Biol. Chem.* (1992) 267:2542, and Crowe *et al.*, *Science* (1994) 264:707.

30

In vivo, TNFs proteolytically cleave a target protein as described in Kriegel *et al.*, *Cell* (1988) 53:45 and Mohler *et al.*, *Nature* (1994) 370:218 and demonstrate cell proliferation and differentiation activity. T-cell or thymocyte proliferation is assayed as described in Armitage *et al.*, *Eur. J. Immunol.* (1992) 22:447; Current Protocols in Immunology, ed. J.E. Coligan *et al.*, 3.1-3.19; Takai *et al.*, *J. Immunol.* (1986) 137:3494-3500, Bertagnoli *et al.*, *J. Immunol.* (1990) 145:1706-1712, Bertagnoli *et al.*, *J. Immunol.* (1991) 133:327-340, Bertagnoli *et al.*, *J. Immunol.* (1992) 149:3778-3783, and Bowman *et al.*, *J. Immunol.* (1994) 152:1756-1761. B cell proliferation and Ig secretion are assayed as described in Maliszewski, *J. Immunol.* (1990) 144:3028-3033, and Assays for B Cell Function: In vitro antibody production, Mond and Brunswick, Current Protocols in Immunol., Coligan Ed vol 1 pp 3.8.1-3.8.16, John Wiley and Sons, Toronto 1994, Kehrl *et al.*, *Science* (1987) 238:1144 and Boussiotis *et al.*, *PNAS USA* (1994) 91:7007.

Other in vivo activities include upregulation of cell surface antigens, upregulation of costimulatory molecules, and cellular aggregation/adhesion as described in Barrett *et al.*, *J. Immunol.* (1991) 146:1722; Bjorck *et al.*, *Eur. J. Immunol.* (1993) 23:1771; Clark *et al.*, *Annu Rev. Immunol.* (1991) 9:97; Ranheim *et al.*, *J. Exp. Med.* (1994) 177:925; Yellin, *J. Immunol.* (1994) 153:666; and Gruss *et al.*, *Blood* (1994) 84:2305.

Proliferation and differentiation of hematopoietic and lymphopoietic cells has also been shown in vivo for TNFs, using assays for embryonic differentiation and hematopoiesis as described in Johansson *et al.*, *Cellular Biology* (1995) 15:141-151, Keller *et al.*, *Mol. Cell. Biol.* (1993) 13:473-486, McClanahan *et al.*, *Blood* (1993) 81:2903-2915 and using assays to detect stem cell survival and differentiation as described in Culture of Hematopoietic Cells, Freshney *et al.* eds, pp 1-21, 23-29, 139-162, 163-179, and 265-268, Wiley-Liss, Inc., New York, NY, 1994, and Hirajama *et al.*, *PNAS USA* (1992) 89:5907-5911.

In vivo activities of TNFs also include lymphocyte survival and apoptosis, assayed as described in Darzynkewicz *et al.*, *Cytometry* (1992) 13:795-808; Gorczyca *et al.*, *Leukemia* (1993) 7:659-670; Itoh *et al.*, *Cell* (1991) 66:233-243; Zacharduk, *J. Immunol.* (1990) 145:4037-4045; Zamai *et al.*, *Cytometry* (1993) 14:891-897; and Gorczyca *et al.*, *Int'l J. Oncol.* (1992) 1:639-648.

Some members of the TNF family are cleaved from the cell surface; others remain membrane bound. The three-dimensional structure of TNF is discussed in Sprang and Eck, *Tumor Necrosis Factors*; *supra*.

TNF proteins include a transmembrane domain. The protein is cleaved into a shorter soluble version, as described in Kriegler *et al.*, *Cell* (1988) 53:45-53, Perez *et al.*, *Cell* (1990) 63:251-258, and Shaw *et al.*, *Cell* (1986) 46:659-667. The transmembrane domain is between amino acid 46 and 77 and the cytoplasmic domain is between position 1 and 45 on the human form of TNF α . The 3-dimensional motifs of TNF include a sandwich of two pleated β -sheets. Each sheet is composed of anti-parallel α -strands. α -Strands facing each other on opposite sites of the sandwich are connected by short polypeptide loops, as described in Van Ostade *et al.*, *Protein Engineering* (1994) 7(1):5-22, and Sprang *et al.*, *Tumor Necrosis Factors*; *supra*.

Residues of the TNF family proteins that are involved in the β -sheet secondary structure have been identified as described in Van Ostade *et al.*, *Protein Engineering* (1994) 7(1):5-22, and Sprang *et al.*, *Tumor Necrosis Factors*; *supra*.

TNF receptors are disclosed in U.S. Patent No. 5,395,760. A profile derived from the TNF receptor family is created by aligning sequences of the TNF receptor family, including Apo1/Fas, TNFR I and II, death receptor3 (DR3), CD40, ox40, CD27, and CD30. Thus, the profile is designed to identify, from the nucleic acids of the invention, sequences of proteins that constitute new members or homologs of this family of proteins.

Tumor necrosis factor receptors exist in two forms in humans: p55 TNFR and p75 TNFR, both of which provide intracellular signals upon binding with a ligand. The extracellular domains of these receptor proteins are cysteine rich. The receptors can remain membrane bound, although some forms of the receptors are cleaved forming soluble receptors. The regulation, diagnostic, prognostic, and therapeutic value of soluble TNF receptors is discussed in Aderka, *Cytokine and Growth Factor Reviews*, (1996) 7(3):231-240.

PDGF Family U.S. Patent No. 5,326,695 discloses platelet derived growth factor agonists; bioactive portions of PDGF-B are used as agonists. U.S. Patent No. 4,845,075 discloses biologically active B-chain homodimers, and also includes variants and derivatives of the PDGF-B chain. U.S. Patent No. 5,128,321 discloses

PDGF analogs and methods of use. Proteins having the same bioactivity as PDGF are disclosed, including A and B chain proteins.

Kinase (Including MKK) Family U.S. Patent No. 5,650,501 discloses serine/threonine kinase, associated with mitotic and meiotic cell division; the protein
5 has a kinase domain in its N-terminal and 3 PEST regions in the C-terminus. U.S. Patent No. 5,605,825 discloses human PAK65, a serine protein kinase.

The foregoing discussion provides a few examples of the protein profiles that can be compared with the nucleic acids of the invention. One skilled in the art can use these and other protein profiles to identify the genes that correlate with the nucleic
10 acids.

IX. Determining the Function of the Encoded Expression Products

Ribozymes, antisense constructs, dominant negative mutants, and triplex formation can be used to determine function of the expression product of an nucleic
15 acid-related gene.

A. Ribozymes

Trans-cleaving catalytic RNAs (ribozymes) are RNA molecules possessing endoribonuclease activity. Ribozymes are specifically designed for a particular target, and the target message must contain a specific nucleotide sequence. They are
20 engineered to cleave any RNA species site-specifically in the background of cellular RNA. The cleavage event renders the mRNA unstable and prevents protein expression. Importantly, ribozymes can be used to inhibit expression of a gene of unknown function for the purpose of determining its function in an in vitro or in vivo context, by detecting the phenotypic effect.

25 One commonly used ribozyme motif is the hammerhead, for which the substrate sequence requirements are minimal. Design of the hammerhead ribozyme is disclosed in Usman *et al.*, *Current Opin. Struct. Biol.* (1996) 6:527-533. Usman also discusses the therapeutic uses of ribozymes. Ribozymes can also be prepared and used as described in Long *et al.*, *FASEB J.* (1993) 7:25; Symons, *Ann. Rev. Biochem.* (1992) 61:641; Perrotta *et al.*, *Biochem.* (1992) 31:16-17; Ojwang *et al.*,
30 *Proc. Natl. Acad. Sci. (USA)* (1992) 89:10802-10806; and U.S. Patent No. 5,254,678. Ribozyme cleavage of HIV-I RNA is described in U.S. Patent No. 5,144,019; methods of cleaving RNA using ribozymes is described in U.S. Patent No.

5,116,742; and methods for increasing the specificity of ribozymes are described in U.S. Patent No. 5,225,337 and Koizumi *et al.*, *Nucleic Acid Res.* (1989) 17:7059-7071. Preparation and use of ribozyme fragments in a hammerhead structure are also described by Koizumi *et al.*, *Nucleic Acids Res.* (1989) 17:7059-7071. Preparation
5 and use of ribozyme fragments in a hairpin structure are described by Chowrira and Burke, *Nucleic Acids Res.* (1992) 20:2835. Ribozymes can also be made by rolling transcription as described in Daubendiek and Kool, *Nat. Biotechnol.* (1997) 15(3):273-277.

The hybridizing region of the ribozyme may be modified or may be prepared
10 as a branched structure as described in Horn and Urdea, *Nucleic Acids Res.* (1989) 17:6959-67. The basic structure of the ribozymes may also be chemically altered in ways familiar to those skilled in the art, and chemically synthesized ribozymes can be administered as synthetic oligonucleotide derivatives modified by monomeric units. In a therapeutic context, liposome mediated delivery of ribozymes improves cellular
15 uptake, as described in Birikh *et al.*, *Eur. J. Biochem.* (1997) 245:1-16.

Using the nucleic acid sequences of the invention and methods known in the art, ribozymes are designed to specifically bind and cut the corresponding mRNA species. Ribozymes thus provide a means to inhibit the expression of any of the proteins encoded by the disclosed nucleic acids or their full-length genes. The full-
20 length gene need not be known in order to design and use specific inhibitory ribozymes. In the case of a nucleic acid or cDNA of unknown function, ribozymes corresponding to that nucleotide sequence can be tested in vitro for efficacy in cleaving the target transcript. Those ribozymes that effect cleavage in vitro are further tested in vivo. The ribozyme can also be used to generate an animal model for a
25 disease, as described in Birikh *et al.*, *Eur. J. Biochem.* (1997) 245:1-16. An effective ribozyme is used to determine the function of the gene of interest by blocking its transcription and detecting a change in the cell. Where the gene is found to be a mediator in a disease, an effective ribozyme is designed and delivered in a gene therapy for blocking transcription and expression of the gene.

30 Therapeutic and functional genomic applications of ribozymes proceed beginning with knowledge of a portion of the coding sequence of the gene to be inhibited. Thus, for many genes, a partial nucleic acid sequence provides adequate sequence for constructing an effective ribozyme. A target cleavage site is selected in

the target sequence, and a ribozyme is constructed based on the 5' and 3' nucleotide sequences that flank the cleavage site. Retroviral vectors are engineered to express monomeric and multimeric hammerhead ribozymes targeting the mRNA of the target coding sequence. These monomeric and multimeric ribozymes are tested in vitro for an ability to cleave the target mRNA. A cell line is stably transduced with the retroviral vectors expressing the ribozymes, and the transduction is confirmed by Northern blot analysis and reverse-transcription polymerase chain reaction (RT-PCR). The cells are screened for inactivation of the target mRNA by such indicators as reduction of expression of disease markers or reduction of the gene product of the target mRNA.

B. Antisense

Antisense nucleic acids are designed to specifically bind to RNA, resulting in the formation of RNA-DNA or RNA-RNA hybrids, with an arrest of DNA replication, reverse transcription or messenger RNA translation. Antisense polynucleotides based on a selected nucleic acid sequence can interfere with expression of the corresponding gene. Antisense polynucleotides are typically generated within the cell by expression from antisense constructs that contain the antisense nucleic acid strand as the transcribed strand. Antisense nucleic acids will bind and/or interfere with the translation of nucleic acid-related mRNA. The expression products of control cells and cells treated with the antisense construct are compared to detect the protein product of the gene corresponding to the nucleic acid. The protein is isolated and identified using routine biochemical methods.

One rationale for using antisense methods to determine the function of the gene corresponding to a nucleic acid is the biological activity of antisense therapeutics. Antisense therapy for a variety of cancers is in clinical phase and has been discussed extensively in the literature. Reed reviewed antisense therapy directed at the Bcl-2 gene in tumors; gene transfer-mediated overexpression of Bcl-2 in tumor cell lines conferred resistance to many types of cancer drugs. (Reed, J.C., *N.C.I.* (1997) 89:988-990). The potential for clinical development of antisense inhibitors of *ras* is discussed by Cowser, L.M., *Anti-Cancer Drug Design* (1997) 12:359-371. Additional important antisense targets include leukemia (Geurtz, A.M., *Anti-Cancer Drug Design* (1997) 12:341-358); human C-ref kinase (Monia, B.P., *Anti-Cancer*

Drug Design (1997) 12:327-339); and protein kinase C (McGraw *et al.*, *Anti-Cancer Drug Design* (1997) 12:315-326.

Given the extensive background literature and clinical experience in antisense therapy, one skilled in the art can use selected nucleic acids of the invention as
5 additional potential therapeutics. The choice of nucleic acid can be narrowed by first testing them for binding to "hot spot" regions of the genome of cancerous cells. If a nucleic acid is identified as binding to a "hot spot", testing the nucleic acid as an antisense compound in the corresponding cancer cells clearly is warranted.

Ogunbiyi *et al.*, *Gastroenterology* (1997) 113(3):761-766 describe prognostic
10 use of allelic loss in colon cancer; Barks *et al.*, *Genes, Chromosomes, and Cancer* (1997) 19(4):278-285 describe increased chromosome copy number detected by FISH in malignant melanoma; Nishizake *et al.*, *Genes, Chromosomes, and Cancer* (1997) 19(4):267-272 describe genetic alterations in primary breast cancer and their metastases and direct comparison using modified comparative genome hybridization;
15 and Elo *et al.*, *Cancer Research* (1997) 57(16):3356-3359 disclose that loss of heterozygosity at 16z24.1-q24.2 is significantly associated with metastatic and aggressive behavior of prostate cancer.

C. Dominant Negative Mutations

20 As an alternative method for identifying function of the nucleic acid-related gene, dominant negative mutations are readily generated for corresponding proteins that are active as homomultimers. A mutant polypeptide will interact with wild-type polypeptides (made from the other allele) and form a non-functional multimer. Thus, a mutation is in a substrate-binding domain, a catalytic domain, or a cellular
25 localization domain. Preferably, the mutant polypeptide will be overproduced. Point mutations are made that have such an effect. In addition, fusion of different polypeptides of various lengths to the terminus of a protein can yield dominant negative mutants. General strategies are available for making dominant negative mutants. See Herskowitz, *Nature* (1987) 329:219-222. Such a technique can be used
30 for creating a loss-of-function mutation, which is useful for determining the function of a protein.

D. Triplex Formation

Endogenous gene expression can also be reduced by inactivating or "knocking out" the gene or its promoter using targeted homologous recombination. (E.g., see Smithies *et al.*, 1985, Nature 317:230-234; Thomas & Capecchi, 1987, Cell 51:503-512; Thompson *et al.*, 1989 Cell 5:313-321; each of which is incorporated by
5 reference herein in its entirety). For example, a mutant, non-functional gene (or a completely unrelated DNA sequence) flanked by DNA homologous to the endogenous gene (either the coding regions or regulatory regions of the gene) can be used, with or without a selectable marker and/or a negative selectable marker, to transfect cells that express that gene *in vivo*. Insertion of the DNA construct, via
10 targeted homologous recombination, results in inactivation of the gene.

Alternatively, endogenous gene expression can be reduced by targeting deoxyribonucleotide sequences complementary to the regulatory region of the target gene (i.e., the gene promoter and/or enhancers) to form triple helical structures that prevent transcription of the gene in target cells in the body. (See generally, Helene, C.
15 1991, Anticancer Drug Des., 6(6):569-84; Helene, C., *et al.*, 1992, Ann. N.Y. Acad. Sci., 660:27-36; and Maher, L.J., 1992, Bioassays 14(12):807-15).

Nucleic acid molecules to be used in triple helix formation for the inhibition of transcription are preferably single stranded and composed of deoxyribonucleotides. The base composition of these oligonucleotides should promote triple helix formation
20 via Hoogsteen base-pairing rules, which generally require sizable stretches of either purines or pyrimidines to be present on one strand of a duplex. Nucleotide sequences may be pyrimidine-based, which will result in TAT and CGC triplets across the three associated strands of the resulting triple helix. The pyrimidine-rich molecules provide base complementarity to a purine-rich region of a single strand of the duplex in a
25 parallel orientation to that strand. In addition, nucleic acid molecules may be chosen that are purine-rich, for example, containing a stretch of G residues. These molecules will form a triple helix with a DNA duplex that is rich in GC pairs, in which the majority of the purine residues are located on a single strand of the targeted duplex, resulting in CGC triplets across the three strands in the triplex.

30 Alternatively, the potential sequences that can be targeted for triple helix formation may be increased by creating a so called "switchback" nucleic acid molecule. Switchback molecules are synthesized in an alternating 5'-3', 3'-5' manner, such that they base pair with first one strand of a duplex and then the other,

eliminating the necessity for a sizable stretch of either purines or pyrimidines to be present on one strand of a duplex.

Antisense RNA and DNA, ribozyme, and triple helix molecules of the invention may be prepared by any method known in the art for the synthesis of DNA and RNA molecules. These include techniques for chemically synthesizing
5 oligodeoxyribonucleotides and oligoribonucleotides well known in the art such as for example solid phase phosphoramidite chemical synthesis. Alternatively, RNA molecules may be generated by *in vitro* and *in vivo* transcription of DNA sequences encoding the antisense RNA molecule. Such DNA sequences may be incorporated
10 into a wide variety of vectors which incorporate suitable RNA polymerase promoters such as the T7 or SP6 polymerase promoters. Alternatively, antisense cDNA constructs that synthesize antisense RNA constitutively or inducibly, depending on the promoter used, can be introduced stably into cell lines.

Moreover, various well known modifications to nucleic acid molecules may be
15 introduced as a means of increasing intracellular stability and half-life. Possible modifications include but are not limited to the addition of flanking sequences of ribonucleotides or deoxyribonucleotides to the 5' and/or 3' ends of the molecule or the use of phosphorothioate or 2' O-methyl rather than phosphodiesterase linkages within the oligodeoxyribonucleotide backbone.

20

X. Diagnostic & Prognostic Assays and Drug Screening Methods

The present invention provides method for determining whether a subject is at risk for developing a disease or condition characterized by unwanted cell proliferation by detecting the disclosed biomarkers, i.e., the disclosed nucleic acid markers (SEQ
25 ID Nos: 1-544) and/or polypeptide markers for colon cancer encoded thereby.

In clinical applications, human tissue samples can be screened for the presence and/or absence of the biomarkers identified herein. Such samples could consist of needle biopsy cores, surgical resection samples, lymph node tissue, or serum. For example, these methods include obtaining a biopsy, which is optionally fractionated
30 by cryostat sectioning to enrich tumor cells to about 80% of the total cell population. In certain embodiments, nucleic acids extracted from these samples may be amplified using techniques well known in the art. The levels of selected markers detected

would be compared with statistically valid groups of metastatic, non-metastatic malignant, benign, or normal colon tissue samples.

In one embodiment, the diagnostic method comprises determining whether a subject has an abnormal mRNA and/or protein level of the disclosed markers, such as by Northern blot analysis, reverse transcription-polymerase chain reaction (RT-PCR), *in situ* hybridization, immunoprecipitation, Western blot hybridization, or immunohistochemistry. According to the method, cells are obtained from a subject and the levels of the disclosed biomarkers, protein or mRNA level, is determined and compared to the level of these markers in a healthy subject. An abnormal level of the biomarker polypeptide or mRNA levels is likely to be indicative of cancer such as colon cancer.

Accordingly, in one aspect, the invention provides probes and primers that are specific to the unique nucleic acid markers disclosed herein. Accordingly, the nucleic acid probes comprise a nucleotide sequence at least 12 nucleotides in length, preferably at least 15 nucleotides, more preferably, 25 nucleotides, and most preferably at least 40 nucleotides, and up to all or nearly all of the coding sequence which is complementary to a portion of the coding sequence of a marker nucleic acid sequence, which nucleic acid sequence is represented by SEQ ID Nos: 1-544 or a sequence complementary thereto.

In one embodiment, the method comprises using a nucleic acid probe to determine the presence of cancerous cells in a tissue from a patient. Specifically, the method comprises:

1. providing a nucleic acid probe comprising a nucleotide sequence at least 12 nucleotides in length, preferably at least 15 nucleotides, more preferably, 25 nucleotides, and most preferably at least 40 nucleotides, and up to all or nearly all of the coding sequence which is complementary to a portion of the coding sequence of a nucleic acid sequence represented by SEQ ID Nos: 1-544 or a sequence complementary thereto and is differentially expressed in tumors cells, such as colon cancer cells;
2. obtaining a tissue sample from a patient potentially comprising cancerous cells;

3. providing a second tissue sample containing cells substantially all of which are non-cancerous;
4. contacting the nucleic acid probe under stringent conditions with RNA of each of said first and second tissue samples (e.g., in a Northern blot or in situ hybridization assay); and
5. comparing (a) the amount of hybridization of the probe with RNA of the first tissue sample, with (b) the amount of hybridization of the probe with RNA of the second tissue sample; wherein a statistically significant difference in the amount of hybridization with the RNA of the first tissue sample as compared to the amount of hybridization with the RNA of the second tissue sample is indicative of the presence of cancerous cells in the first tissue sample.

In one aspect, the method comprises in situ hybridization with a probe derived from a given marker nucleic acid sequence, which nucleic acid sequence is represented by SEQ ID Nos: 1-544 or a sequence complementary thereto. The method comprises contacting the labeled hybridization probe with a sample of a given type of tissue potentially containing cancerous or pre-cancerous cells as well as normal cells, and determining whether the probe labels some cells of the given tissue type to a degree significantly different (e.g., by at least a factor of two, or at least a factor of five, or at least a factor of twenty, or at least a factor of fifty) than the degree to which it labels other cells of the same tissue type.

Also within the invention is a method of determining the phenotype of a test cell from a given human tissue, e.g., whether the cell is (a) normal, or (b) cancerous or precancerous, by contacting the mRNA of a test cell with a nucleic acid probe at least 12 nucleotides in length, preferably at least 15 nucleotides, more preferably at least 25 nucleotides, and most preferably at least 40 nucleotides, and up to all or nearly all of a sequence which is complementary to a portion of the coding sequence of a nucleic acid sequence represented by SEQ ID Nos: 1-544 or a sequence complementary thereto, and which is differentially expressed in tumor cells as compared to normal cells of the given tissue type; and determining the approximate amount of hybridization of the probe to the mRNA, an amount of hybridization either more or less than that seen with the mRNA of a normal cell of that tissue type being indicative that the test cell is cancerous or pre-cancerous.

Alternatively, the above diagnostic assays may be carried out using antibodies to detect the protein product encoded by the marker nucleic acid sequence, which nucleic acid sequence is represented by SEQ ID Nos: 1-544 or a sequence complementary thereto. Accordingly, in one embodiment, the assay would include
5 contacting the proteins of the test cell with an antibody specific for the gene product of a nucleic acid represented by SEQ ID Nos: 1-544 or a sequence complementary thereto, the marker nucleic acid being one which is expressed at a given control level in normal cells of the same tissue type as the test cell, and determining the
10 approximate amount of immunocomplex formation by the antibody and the proteins of the test cell, wherein a statistically significant difference in the amount of the immunocomplex formed with the proteins of a test cell as compared to a normal cell of the same tissue type is an indication that the test cell is cancerous or pre-cancerous.

Another such method includes the steps of: providing an antibody specific for the gene product of a marker nucleic acid sequence represented by SEQ ID Nos 1-
15 544, the gene product being present in cancerous tissue of a given tissue type (e.g., colon tissue) at a level more or less than the level of the gene product in non-cancerous tissue of the same tissue type; obtaining from a patient a first sample of tissue of the given tissue type, which sample potentially includes cancerous cells; providing a second sample of tissue of the same tissue type (which may be from the
20 same patient or from a normal control, e.g. another individual or cultured cells), this second sample containing normal cells and essentially no cancerous cells; contacting the antibody with protein (which may be partially purified, in lysed but unfractionated cells, or in situ) of the first and second samples under conditions permitting immunocomplex formation between the antibody and the marker nucleic acid
25 sequence product present in the samples; and comparing (a) the amount of immunocomplex formation in the first sample, with (b) the amount of immunocomplex formation in the second sample, wherein a statistically significant difference in the amount of immunocomplex formation in the first sample less as compared to the amount of immunocomplex formation in the second sample is
30 indicative of the presence of cancerous cells in the first sample of tissue.

The subject invention further provides a method of determining whether a cell sample obtained from a subject possesses an abnormal amount of marker polypeptide which comprises (a) obtaining a cell sample from the subject, (b) quantitatively

determining the amount of the marker polypeptide in the sample so obtained, and (c) comparing the amount of the marker polypeptide so determined with a known standard, so as to thereby determine whether the cell sample obtained from the subject possesses an abnormal amount of the marker polypeptide. Such marker polypeptides may be detected by immunohistochemical assays, dot-blot assays, ELISA and the like.

Immunoassays are commonly used to quantitate the levels of proteins in cell samples, and many other immunoassay techniques are known in the art. The invention is not limited to a particular assay procedure, and therefore is intended to include both homogeneous and heterogeneous procedures. Exemplary immunoassays which can be conducted according to the invention include fluorescence polarization immunoassay (FPIA), fluorescence immunoassay (FIA), enzyme immunoassay (EIA), nephelometric inhibition immunoassay (NIA), enzyme linked immunosorbent assay (ELISA), and radioimmunoassay (RIA). An indicator moiety, or label group, can be attached to the subject antibodies and is selected so as to meet the needs of various uses of the method which are often dictated by the availability of assay equipment and compatible immunoassay procedures. General techniques to be used in performing the various immunoassays noted above are known to those of ordinary skill in the art.

In another embodiment, the level of the encoded product, i.e., the product encoded by SEQ ID Nos 1-544 or a sequence complementary thereto, in a biological fluid (e.g., blood or urine) of a patient may be determined as a way of monitoring the level of expression of the marker nucleic acid sequence in cells of that patient. Such a method would include the steps of obtaining a sample of a biological fluid from the patient, contacting the sample (or proteins from the sample) with an antibody specific for a encoded marker polypeptide, and determining the amount of immune complex formation by the antibody, with the amount of immune complex formation being indicative of the level of the marker encoded product in the sample. This determination is particularly instructive when compared to the amount of immune complex formation by the same antibody in a control sample taken from a normal individual or in one or more samples previously or subsequently obtained from the same person.

In another embodiment, the method can be used to determine the amount of marker polypeptide present in a cell, which in turn can be correlated with progression

of a hyperproliferative disorder, e.g., colon cancer. The level of the marker polypeptide can be used predictively to evaluate whether a sample of cells contains cells which are, or are predisposed towards becoming, transformed cells. Moreover, the subject method can be used to assess the phenotype of cells which are known to be transformed, the phenotyping results being useful in planning a particular therapeutic regimen. For instance, very high levels of the marker polypeptide in sample cells is a powerful diagnostic and prognostic marker for a cancer, such as colon cancer. The observation of marker polypeptide level can be utilized in decisions regarding, e.g., the use of more aggressive therapies.

As set out above, one aspect of the present invention relates to diagnostic assays for determining, in the context of cells isolated from a patient, if the level of a marker polypeptide is significantly reduced in the sample cells. The term "significantly reduced" refers to a cell phenotype wherein the cell possesses a reduced cellular amount of the marker polypeptide relative to a normal cell of similar tissue origin. For example, a cell may have less than about 50%, 25%, 10%, or 5% of the marker polypeptide that a normal control cell. In particular, the assay evaluates the level of marker polypeptide in the test cells, and, preferably, compares the measured level with marker polypeptide detected in at least one control cell, e.g., a normal cell and/or a transformed cell of known phenotype.

Of particular importance to the subject invention is the ability to quantitate the level of marker polypeptide as determined by the number of cells associated with a normal or abnormal marker polypeptide level. The number of cells with a particular marker polypeptide phenotype may then be correlated with patient prognosis. In one embodiment of the invention, the marker polypeptide phenotype of the lesion is determined as a percentage of cells in a biopsy which are found to have abnormally high/low levels of the marker polypeptide. Such expression may be detected by immunohistochemical assays, dot-blot assays, ELISA and the like.

Where tissue samples are employed, immunohistochemical staining may be used to determine the number of cells having the marker polypeptide phenotype. For such staining, a multiblock of tissue is taken from the biopsy or other tissue sample and subjected to proteolytic hydrolysis, employing such agents as protease K or pepsin. In certain embodiments, it may be desirable to isolate a nuclear fraction from the sample cells and detect the level of the marker polypeptide in the nuclear fraction.

The tissue samples are fixed by treatment with a reagent such as formalin, glutaraldehyde, methanol, or the like. The samples are then incubated with an antibody, preferably a monoclonal antibody, with binding specificity for the marker polypeptides. This antibody may be conjugated to a label for subsequent detection of binding. Samples are incubated for a time sufficient for formation of the immuno-complexes. Binding of the antibody is then detected by virtue of a label conjugated to this antibody. Where the antibody is unlabeled, a second labeled antibody may be employed, e.g., which is specific for the isotype of the anti-marker polypeptide antibody. Examples of labels which may be employed include radionuclides, fluorescers, chemiluminescers, enzymes and the like.

Where enzymes are employed, the substrate for the enzyme may be added to the samples to provide a colored or fluorescent product. Examples of suitable enzymes for use in conjugates include horseradish peroxidase, alkaline phosphatase, malate dehydrogenase and the like. Where not commercially available, such antibody-enzyme conjugates are readily produced by techniques known to those skilled in the art.

In one embodiment, the assay is performed as a dot blot assay. The dot blot assay finds particular application where tissue samples are employed as it allows determination of the average amount of the marker polypeptide associated with a single cell by correlating the amount of marker polypeptide in a cell-free extract produced from a predetermined number of cells.

It is well established in the cancer literature that tumor cells of the same type (e.g., breast and/or colon tumor cells) may not show uniformly increased expression of individual oncogenes or uniformly decreased expression of individual tumor suppressor genes. There may also be varying levels of expression of a given marker gene even between cells of a given type of cancer, further emphasizing the need for reliance on a battery of tests rather than a single test. Accordingly, in one aspect, the invention provides for a battery of tests utilizing a number of probes of the invention, in order to improve the reliability and/or accuracy of the diagnostic test.

In one embodiment, the present invention also provides a method wherein nucleic acid probes are immobilized on a DNA chip in an organized array. Oligonucleotides can be bound to a solid support by a variety of processes, including lithography. For example a chip can hold up to 250,000 oligonucleotides (GeneChip,

Affymetrix). These nucleic acid probes comprise a nucleotide sequence at least about 12 nucleotides in length, preferably at least about 15 nucleotides, more preferably at least about 25 nucleotides, and most preferably at least about 40 nucleotides, and up to all or nearly all of a sequence which is complementary to a portion of the coding
5 sequence of a marker nucleic acid sequence represented by SEQ ID Nos: 1-544 and is differentially expressed in tumor cells, such as colon cancer cells. The present invention provides significant advantages over the available tests for various cancers, such as colon cancer, because it increases the reliability of the test by providing an array of nucleic acid markers on a single chip.

10 The method includes obtaining a biopsy, which is optionally fractionated by cryostat sectioning to enrich tumor cells to about 80% of the total cell population. The DNA or RNA is then extracted, amplified, and analyzed with a DNA chip to determine the presence of absence of the marker nucleic acid sequences.

In one embodiment, the nucleic acid probes are spotted onto a substrate in a
15 two-dimensional matrix or array. Samples of nucleic acids can be labeled and then hybridized to the probes. Double-stranded nucleic acids, comprising the labeled sample nucleic acids bound to probe nucleic acids, can be detected once the unbound portion of the sample is washed away.

The probe nucleic acids can be spotted on substrates including glass,
20 nitrocellulose, etc. The probes can be bound to the substrate by either covalent bonds or by non-specific interactions, such as hydrophobic interactions. The sample nucleic acids can be labeled using radioactive labels, fluorophores, chromophores, etc.

Techniques for constructing arrays and methods of using these arrays are described in EP No. 0 799 897; PCT No. WO 97/29212; PCT No. WO 97/27317; EP
25 No. 0 785 280; PCT No. WO 97/02357; U.S. Pat. No. 5,593,839; U.S. Pat. No. 5,578,832; EP No. 0 728 520; U.S. Pat. No. 5,599,695; EP No. 0 721 016; U.S. Pat. No. 5,556,752; PCT No. WO 95/22058; and U.S. Pat. No. 5,631,734.

Further, arrays can be used to examine differential expression of genes and can be used to determine gene function. For example, arrays of the instant nucleic acid
30 sequences can be used to determine if any of the nucleic acid sequences are differentially expressed between normal cells and cancer cells, for example. High expression of a particular message in a cancer cell, which is not observed in a corresponding normal cell, can indicate a cancer specific protein.

In yet another embodiment, the invention contemplates using a panel of antibodies which are generated against the marker polypeptides of this invention, which polypeptides are encoded by SEQ ID Nos: 1-544. Such a panel of antibodies may be used as a reliable diagnostic probe for colon cancer. The assay of the present invention comprises contacting a biopsy sample containing cells, e.g., colon cells, with a panel of antibodies to one or more of the encoded products to determine the presence or absence of the marker polypeptides.

The diagnostic methods of the subject invention may also be employed as follow-up to treatment, e.g., quantitation of the level of marker polypeptides may be indicative of the effectiveness of current or previously employed cancer therapies as well as the effect of these therapies upon patient prognosis.

Accordingly, the present invention makes available diagnostic assays and reagents for detecting gain and/or loss of marker polypeptides from a cell in order to aid in the diagnosis and phenotyping of proliferative disorders arising from, for example, tumorigenic transformation of cells.

The diagnostic assays described above can be adapted to be used as prognostic assays, as well. Such an application takes advantage of the sensitivity of the assays of the invention to events which take place at characteristic stages in the progression of a tumor. For example, a given marker gene may be up- or downregulated at a very early stage, perhaps before the cell is irreversibly committed to developing into a malignancy, while another marker gene may be characteristically up or down regulated only at a much later stage. Such a method could involve the steps of contacting the mRNA of a test cell with a nucleic acid probe derived from a given marker nucleic acid which is expressed at different characteristic levels in cancerous or precancerous cells at different stages of tumor progression, and determining the approximate amount of hybridization of the probe to the mRNA of the cell, such amount being an indication of the level of expression of the gene in the cell, and thus an indication of the stage of tumor progression of the cell; alternatively, the assay can be carried out with an antibody specific for the gene product of the given marker nucleic acid, contacted with the proteins of the test cell. A battery of such tests will disclose not only the existence and location of a tumor, but also will allow the clinician to select the mode of treatment most appropriate for the tumor, and to predict the likelihood of success of that treatment.

The methods of the invention can also be used to follow the clinical course of a tumor. For example, the assay of the invention can be applied to a tissue sample from a patient; following treatment of the patient for the cancer, another tissue sample is taken and the test repeated. Successful treatment will result in either removal of all
5 cells which demonstrate differential expression characteristic of the cancerous or precancerous cells, or a substantial increase in expression of the gene in those cells, perhaps approaching or even surpassing normal levels.

In yet another embodiment, the invention provides methods for determining whether a subject is at risk for developing a disease, such as a predisposition to
10 develop cancer, for example colon cancer, associated with an aberrant activity of any one of the polypeptides encoded by nucleic acids of SEQ ID Nos: 1-544, wherein the aberrant activity of the polypeptide is characterized by detecting the presence or absence of a genetic lesion characterized by at least one of (i) an alteration affecting the integrity of a gene encoding a marker polypeptides, or (ii) the mis-expression of
15 the encoding nucleic acid. To illustrate, such genetic lesions can be detected by ascertaining the existence of at least one of (i) a deletion of one or more nucleotides from the nucleic acid sequence, (ii) an addition of one or more nucleotides to the nucleic acid sequence, (iii) a substitution of one or more nucleotides of the nucleic acid sequence, (iv) a gross chromosomal rearrangement of the nucleic acid sequence,
20 (v) a gross alteration in the level of a messenger RNA transcript of the nucleic acid sequence, (vi) aberrant modification of the nucleic acid sequence, such as of the methylation pattern of the genomic DNA, (vii) the presence of a non-wild type splicing pattern of a messenger RNA transcript of the gene, (viii) a non-wild type level of the marker polypeptide, (ix) allelic loss of the gene, and/or (x) inappropriate
25 post-translational modification of the marker polypeptide.

The present invention provides assay techniques for detecting lesions in the encoding nucleic acid sequence. These methods include, but are not limited to, methods involving sequence analysis, Southern blot hybridization, restriction enzyme site mapping, and methods involving detection of absence of nucleotide pairing
30 between the nucleic acid to be analyzed and a probe.

Specific diseases or disorders, e.g., genetic diseases or disorders, are associated with specific allelic variants of polymorphic regions of certain genes, which do not necessarily encode a mutated protein. Thus, the presence of a specific

allelic variant of a polymorphic region of a gene in a subject can render the subject susceptible to developing a specific disease or disorder. Polymorphic regions in genes, can be identified, by determining the nucleotide sequence of genes in populations of individuals. If a polymorphic region is identified, then the link with a specific disease can be determined by studying specific populations of individuals, e.g, individuals which developed a specific disease, such as colon cancer. A polymorphic region can be located in any region of a gene, e.g., exons, in coding or non coding regions of exons, introns, and promoter region.

In an exemplary embodiment, there is provided a nucleic acid composition comprising a nucleic acid probe including a region of nucleotide sequence which is capable of hybridizing to a sense or antisense sequence of a gene or naturally occurring mutants thereof, or 5' or 3' flanking sequences or intronic sequences naturally associated with the subject genes or naturally occurring mutants thereof. The nucleic acid of a cell is rendered accessible for hybridization, the probe is contacted with the nucleic acid of the sample, and the hybridization of the probe to the sample nucleic acid is detected. Such techniques can be used to detect lesions or allelic variants at either the genomic or mRNA level, including deletions, substitutions, etc., as well as to determine mRNA transcript levels.

A preferred detection method is allele specific hybridization using probes overlapping the mutation or polymorphic site and having about 5, 10, 20, 25, or 30 nucleotides around the mutation or polymorphic region. In a preferred embodiment of the invention, several probes capable of hybridizing specifically to allelic variants are attached to a solid phase support, e.g., a "chip". Mutation detection analysis using these chips comprising oligonucleotides, also termed "DNA probe arrays" is described e.g., in Cronin et al. (1996) *Human Mutation* 7:244. In one embodiment, a chip comprises all the allelic variants of at least one polymorphic region of a gene. The solid phase support is then contacted with a test nucleic acid and hybridization to the specific probes is detected. Accordingly, the identity of numerous allelic variants of one or more genes can be identified in a simple hybridization experiment.

In certain embodiments, detection of the lesion comprises utilizing the probe/primer in a polymerase chain reaction (PCR) (see, e.g. U.S. Patent Nos. 4,683,195 and 4,683,202), such as anchor PCR or RACE PCR, or, alternatively, in a ligase chain reaction (LCR) (see, e.g., Landegran *et al.* (1988) *Science* 241:1077-

1080; and Nakazawa *et al.* (1994) *PNAS* 91:360-364), the latter of which can be particularly useful for detecting point mutations in the gene (see Abravaya *et al.* (1995) *Nuc Acid Res* 23:675-682). In a merely illustrative embodiment, the method includes the steps of (i) collecting a sample of cells from a patient, (ii) isolating
5 nucleic acid (e.g., genomic, mRNA or both) from the cells of the sample, (iii) contacting the nucleic acid sample with one or more primers which specifically hybridize to a nucleic acid sequence under conditions such that hybridization and amplification of the nucleic acid (if present) occurs, and (iv) detecting the presence or absence of an amplification product, or detecting the size of the amplification product
10 and comparing the length to a control sample. It is anticipated that PCR and/or LCR may be desirable to use as a preliminary amplification step in conjunction with any of the techniques used for detecting mutations described herein.

Alternative amplification methods include: self sustained sequence replication (Guatelli, J.C. *et al.*, 1990, *Proc. Natl. Acad. Sci. USA* 87:1874-1878), transcriptional
15 amplification system (Kwoh, D.Y. *et al.*, 1989, *Proc. Natl. Acad. Sci. USA* 86:1173-1177), Q-Beta Replicase (Lizardi, P.M. *et al.*, 1988, *Bio/Technology* 6:1197), or any other nucleic acid amplification method, followed by the detection of the amplified molecules using techniques well known to those of skill in the art. These detection schemes are especially useful for the detection of nucleic acid molecules if such
20 molecules are present in very low numbers.

In a preferred embodiment of the subject assay, mutations in, or allelic variants, of a gene from a sample cell are identified by alterations in restriction enzyme cleavage patterns. For example, sample and control DNA is isolated, amplified (optionally), digested with one or more restriction endonucleases, and
25 fragment length sizes are determined by gel electrophoresis. Moreover, the use of sequence specific ribozymes (see, for example, U.S. Patent No. 5,498,531) can be used to score for the presence of specific mutations by development or loss of a ribozyme cleavage site.

Another aspect of the invention is directed to the identification of agents
30 capable of modulating the differentiation and proliferation of cells characterized by aberrant proliferation. In this regard, the invention provides assays for determining compounds that modulate the expression of the marker nucleic acids (SEQ ID Nos: 1-544) and/or alter for example, inhibit the bioactivity of the encoded polypeptide.

Several in vivo methods can be used to identify compounds that modulate expression of the marker nucleic acids (SEQ ID Nos: 1-544) and/or alter for example, inhibit the bioactivity of the encoded polypeptide.

Drug screening is performed by adding a test compound to a sample of cells, and monitoring the effect. A parallel sample which does not receive the test compound is also monitored as a control. The treated and untreated cells are then compared by any suitable phenotypic criteria, including but not limited to microscopic analysis, viability testing, ability to replicate, histological examination, the level of a particular RNA or polypeptide associated with the cells, the level of enzymatic activity expressed by the cells or cell lysates, and the ability of the cells to interact with other cells or compounds. Differences between treated and untreated cells indicates effects attributable to the test compound.

Desirable effects of a test compound include an effect on any phenotype that was conferred by the cancer-associated marker nucleic acid sequence. Examples include a test compound that limits the overabundance of mRNA, limits production of the encoded protein, or limits the functional effect of the protein. The effect of the test compound would be apparent when comparing results between treated and untreated cells.

The invention thus also encompasses methods of screening for agents which inhibit expression of the nucleic acid markers (SEQ ID Nos: 1-544) in vitro, comprising exposing a cell or tissue in which the marker nucleic acid mRNA is detectable in cultured cells to an agent in order to determine whether the agent is capable of inhibiting production of the mRNA; and determining the level of mRNA in the exposed cells or tissue, wherein a decrease in the level of the mRNA after exposure of the cell line to the agent is indicative of inhibition of the marker nucleic acid mRNA production.

Alternatively, the screening method may include in vitro screening of a cell or tissue in which marker protein is detectable in cultured cells to an agent suspected of inhibiting production of the marker protein; and determining the level of the marker protein in the cells or tissue, wherein a decrease in the level of marker protein after exposure of the cells or tissue to the agent is indicative of inhibition of marker protein production.

The invention also encompasses in vivo methods of screening for agents which inhibit expression of the marker nucleic acids, comprising exposing a mammal having tumor cells in which marker mRNA or protein is detectable to an agent suspected of inhibiting production of marker mRNA or protein; and determining the
5 level of marker mRNA or protein in tumor cells of the exposed mammal. A decrease in the level of marker mRNA or protein after exposure of the mammal to the agent is indicative of inhibition of marker nucleic acid expression.

Accordingly, the invention provides a method comprising incubating a cell expressing the marker nucleic acids (SEQ ID Nos: 1-544) with a test compound and
10 measuring the mRNA or protein level. The invention further provides a method for quantitatively determining the level of expression of the marker nucleic acids in a cell population, and a method for determining whether an agent is capable of increasing or decreasing the level of expression of the marker nucleic acids in a cell population. The method for determining whether an agent is capable of increasing or decreasing
15 the level of expression of the marker nucleic acids in a cell population comprises the steps of (a) preparing cell extracts from control and agent-treated cell populations, (b) isolating the marker polypeptides from the cell extracts, (c) quantifying (e.g., in parallel) the amount of an immunocomplex formed between the marker polypeptide and an antibody specific to said polypeptide. The marker polypeptides of this
20 invention may also be quantified by assaying for its bioactivity. Agents that induce increased the marker nucleic acid expression may be identified by their ability to increase the amount of immunocomplex formed in the treated cell as compared with the amount of the immunocomplex formed in the control cell. In a similar manner, agents that decrease expression of the marker nucleic acid may be identified by their
25 ability to decrease the amount of the immunocomplex formed in the treated cell extract as compared to the control cell.

mRNA levels can be determined by Northern blot hybridization. mRNA levels can also be determined by methods involving PCR. Other sensitive methods for measuring mRNA, which can be used in high throughput assays, e.g., a method using
30 a DELFIA endpoint detection and quantification method, are described, e.g., in Webb and Hurskainen (1996) *Journal of Biomolecular Screening* 1:119. Marker protein levels can be determined by immunoprecipitations or immunohistochemistry using an

antibody that specifically recognizes the protein product encoded by SEQ ID Nos: 1-544.

Agents that are identified as active in the drug screening assay are candidates to be tested for their capacity to block cell proliferation activity. These agents would be useful for treating a disorder involving aberrant growth of cells, especially colon cells.

A variety of assay formats will suffice and, in light of the present disclosure, those not expressly described herein will nevertheless be comprehended by one of ordinary skill in the art. For instance, the assay can be generated in many different formats, and include assays based on cell-free systems, e.g., purified proteins or cell lysates, as well as cell-based assays which utilize intact cells.

In many drug screening programs which test libraries of compounds and natural extracts, high throughput assays are desirable in order to maximize the number of compounds surveyed in a given period of time. Assays of the present invention which are performed in cell-free systems, such as may be derived with purified or semi-purified proteins or with lysates, are often preferred as "primary" screens in that they can be generated to permit rapid development and relatively easy detection of an alteration in a molecular target which is mediated by a test compound. Moreover, the effects of cellular toxicity and/or bioavailability of the test compound can be generally ignored in the *in vitro* system, the assay instead being focused primarily on the effect of the drug on the molecular target as may be manifest in an alteration of binding affinity with other proteins or changes in enzymatic properties of the molecular target.

A. Use of Nucleic Acids as Probes in Mapping and in Tissue Profiling Probes

Polynucleotide probes as described above, e.g., comprising at least 12 contiguous nucleotides selected from the nucleotide sequence of an nucleic acid as shown in SEQ ID Nos. 1-544, preferably SEQ ID Nos. 1-168, even more preferably SEQ ID Nos. 1-35, or a sequence complementary thereto, are used for a variety of purposes, including identification of human chromosomes and determining transcription levels. Additional disclosure about preferred regions of the nucleic acid sequences is found in the accompanying tables.

The nucleotide probes are labeled, for example, with a radioactive, fluorescent, biotinylated, or chemiluminescent label, and detected by well known methods appropriate for the particular label selected. Protocols for hybridizing nucleotide probes to preparations of metaphase chromosomes are also well known in the art. A nucleotide probe will hybridize specifically to nucleotide sequences in the chromosome preparations which are complementary to the nucleotide sequence of the probe. A probe that hybridizes specifically to a nucleic acid should provide a detection signal at least 5-, 10-, or 20-fold higher than the background hybridization provided with other unrelated sequences.

In a non-limiting example, commercial programs are available for identifying regions of chromosomes commonly associated with disease, such as cancer. Nucleic acids of the invention can be used to probe these regions. For example, if, through profile searching, a nucleic acid is identified as corresponding to a gene encoding a kinase, its ability to bind to a cancer-related chromosomal region will suggest its role as a kinase in one or more stages of tumor cell development/growth. Although some experimentation would be required to elucidate the role, the nucleic acid constitutes a new material for isolating a specific protein that has potential for developing a cancer diagnostic or therapeutic.

Nucleotide probes are used to detect expression of a gene corresponding to the nucleic acid. For example, in Northern blots, mRNA is separated electrophoretically and contacted with a probe. A probe is detected as hybridizing to an mRNA species of a particular size. The amount of hybridization is quantitated to determine relative amounts of expression, for example under a particular condition. Probes are also used to detect products of amplification by polymerase chain reaction. The products of the reaction are hybridized to the probe and hybrids are detected. Probes are used for in situ hybridization to cells to detect expression. Probes can also be used in vivo for diagnostic detection of hybridizing sequences. Probes are typically labeled with a radioactive isotope. Other types of detectable labels may be used such as chromophores, fluorophores, and enzymes.

Expression of specific mRNA can vary in different cell types and can be tissue specific. This variation of mRNA levels in different cell types can be exploited with nucleic acid probe assays to determine tissue types. For example, PCR, branched DNA probe assays, or blotting techniques utilizing nucleic acid probes substantially

identical or complementary to nucleic acids of SEQ ID Nos. 1-544, preferably SEQ ID Nos. 1-168, even more preferably SEQ ID Nos. 1-35, or a sequence complementary thereto, can determine the presence or absence of target cDNA or mRNA.

5 Examples of a nucleotide hybridization assay are described in Urdea *et al.*, PCT WO92/02526 and Urdea *et al.*, U.S. Patent No. 5,124,246, both incorporated herein by reference. The references describe an example of a sandwich nucleotide hybridization assay.

10 Alternatively, the Polymerase Chain Reaction (PCR) is another means for detecting small amounts of target nucleic acids, as described in Mullis *et al.*, *Meth. Enzymol.* (1987) 155:335-350; U.S. Patent No. 4,683,195; and U.S. Patent No. 4,683,202, all incorporated herein by reference. Two primer polynucleotides nucleotides hybridize with the target nucleic acids and are used to prime the reaction. The primers may be composed of sequence within or 3' and 5' to the polynucleotides
15 of the Sequence Listing. Alternatively, if the primers are 3' and 5' to these polynucleotides, they need not hybridize to them or the complements. A thermostable polymerase creates copies of target nucleic acids from the primers using the original target nucleic acids as a template. After a large amount of target nucleic acids is generated by the polymerase, it is detected by methods such as Southern blots. When
20 using the Southern blot method, the labeled probe will hybridize to a polynucleotide of the Sequence Listing or complement.

 Furthermore, mRNA or cDNA can be detected by traditional blotting techniques described in Sambrook *et al.*, "Molecular Cloning: A Laboratory Manual" (New York, Cold Spring Harbor Laboratory, 1989). mRNA or cDNA generated from
25 mRNA using a polymerase enzyme can be purified and separated using gel electrophoresis. The nucleic acids on the gel are then blotted onto a solid support, such as nitrocellulose. The solid support is exposed to a labeled probe and then washed to remove any unhybridized probe. Next, the duplexes containing the labeled probe are detected. Typically, the probe is labeled with radioactivity.

30

Mapping

Nucleic acids of the present invention are used to identify a chromosome on which the corresponding gene resides. Using fluorescence in situ hybridization

(FISH) on normal metaphase spreads, comparative genomic hybridization allows total genome assessment of changes in relative copy number of DNA sequences. See Schwartz and Samad, *Current Opinions in Biotechnology* (1994) 8:70-74; Kallioniemi *et al.*, *Seminars in Cancer Biology* (1993) 4:41-46; Valdes and Tagle, *Methods in*
5 *Molecular Biology* (1997) 68:1, Boultonwood, ed., Human Press, Totowa, NJ.

Preparations of human metaphase chromosomes are prepared using standard cytogenetic techniques from human primary tissues or cell lines. Nucleotide probes comprising at least 12 contiguous nucleotides selected from the nucleotide sequence of SEQ ID Nos. 1-544, preferably SEQ ID Nos. 1-168, even more preferably SEQ ID
10 Nos. 1-35, or a sequence complementary thereto, are used to identify the corresponding chromosome. The nucleotide probes are labeled, for example, with a radioactive, fluorescent, biotinylated, or chemiluminescent label, and detected by well known methods appropriate for the particular label selected. Protocols for hybridizing nucleotide probes to preparations of metaphase chromosomes are also well known in
15 the art. A nucleotide probe will hybridize specifically to nucleotide sequences in the chromosome preparations that are complementary to the nucleotide sequence of the probe. A probe that hybridizes specifically to a target gene provides a detection signal at least 5-, 10-, or 20-fold higher than the background hybridization provided with unrelated coding sequences.

20 Nucleic acids are mapped to particular chromosomes using, for example, radiation hybrids or chromosome-specific hybrid panels. See Leach *et al.*, *Advances in Genetics*, (1995) 33:63-99; Walter *et al.*, *Nature Genetics* (1994) 7:22-28; Walter and Goodfellow, *Trends in Genetics* (1992) 9:352. Panels for radiation hybrid mapping are available from Research Genentics, Inc., Huntsville, Alabama, USA.
25 Databases for markers using various panels are available via the world wide web at <http://F/shgc-www.stanford.edu>; and other locations. The statistical program RHMAP can be used to construct a map based on the data from radiation hybridization with a measure of the relative likelihood of one order versus another. RHMAP is available via the world wide web at <http://www.sph.umich.edu/group/statgen/software>.

30 Such mapping can be useful in identifying the function of the target gene by its proximity to other genes with known function. Function can also be assigned to the target gene when particular syndromes or diseases map to the same chromosome.

Tissue Profiling

The nucleic acids of the present invention can be used to determine the tissue type from which a given sample is derived. For example, a metastatic lesion is identified by its developmental organ or tissue source by identifying the expression of a particular marker of that organ or tissue. If a nucleic acid is expressed only in a specific tissue type, and a metastatic lesion is found to express that nucleic acid, then the developmental source of the lesion has been identified. Expression of a particular nucleic acid is assayed by detection of either the corresponding mRNA or the protein product. Immunological methods, such as antibody staining, are used to detect a particular protein product. Hybridization methods may be used to detect particular mRNA species, including but not limited to in situ hybridization and Northern blotting.

Use of Polymorphisms

A nucleic acid will be useful in forensics, genetic analysis, mapping, and diagnostic applications if the corresponding region of a gene is polymorphic in the human population. A particular polymorphic form of the nucleic acid may be used to either identify a sample as deriving from a suspect or rule out the possibility that the sample derives from the suspect. Any means for detecting a polymorphism in a gene are used, including but not limited to electrophoresis of protein polymorphic variants, differential sensitivity to restriction enzyme cleavage, and hybridization to an allele-specific probe.

B. Use of Nucleic Acids and Encoded Polypeptides to Raise Antibodies

Expression products of a nucleic acid, the corresponding mRNA or cDNA, or the corresponding complete gene are prepared and used for raising antibodies for experimental, diagnostic, and therapeutic purposes. For nucleic acids to which a corresponding gene has not been assigned, this provides an additional method of identifying the corresponding gene. The nucleic acid or related cDNA is expressed as described above, and antibodies are prepared. These antibodies are specific to an epitope on the encoded polypeptide, and can precipitate or bind to the corresponding native protein in a cell or tissue preparation or in a cell-free extract of an in vitro expression system.

Immunogens for raising antibodies are prepared by mixing the polypeptides encoded by the nucleic acids of the present invention with adjuvants. Alternatively, polypeptides are made as fusion proteins to larger immunogenic proteins. Polypeptides are also covalently linked to other larger immunogenic proteins, such as

5 keyhole limpet hemocyanin. Immunogens are typically administered intradermally, subcutaneously, or intramuscularly. Immunogens are administered to experimental animals such as rabbits, sheep, and mice, to generate antibodies. Optionally, the animal spleen cells are isolated and fused with myeloma cells to form hybridomas which secrete monoclonal antibodies. Such methods are well known in the art.

10 According to another method known in the art, the nucleic acid is administered directly, such as by intramuscular injection, and expressed in vivo. The expressed protein generates a variety of protein-specific immune responses, including production of antibodies, comparable to administration of the protein.

Preparations of polyclonal and monoclonal antibodies specific for nucleic

15 acid-encoded proteins and polypeptides are made using standard methods known in the art. The antibodies specifically bind to epitopes present in the polypeptides encoded by a nucleic acid of SEQ ID Nos. 1-544, preferably SEQ ID Nos. 1-168, even more preferably SEQ ID Nos. 1-35, or a sequence complementary thereto. In another embodiment, the antibodies specifically bind to epitopes present in a polypeptide

20 encoded by SEQ ID Nos. 1-544. Typically, at least about 6, 8, 10, or 12 contiguous amino acids are required to form an epitope. However, epitopes which involve non-contiguous amino acids may require more, for example, at least about 15, 25, or 50 amino acids. A short sequence of a nucleic acid may then be unsuitable for use as an epitope to raise antibodies for identifying the corresponding novel protein, because of

25 the potential for cross-reactivity with a known protein. However, the antibodies may be useful for other purposes, particularly if they identify common structural features of a known protein and a novel polypeptide encoded by a nucleic acid of the invention.

Antibodies that specifically bind to human nucleic acid-encoded polypeptides

30 should provide a detection signal at least about 5-, 10-, or 20-fold higher than a detection signal provided with other proteins when used in Western blots or other immunochemical assays. Preferably, antibodies that specifically bind nucleic acid T-

encoded polypeptides do not detect other proteins in immunochemical assays and can immunoprecipitate nucleic acid-encoded proteins from solution.

To test for the presence of serum antibodies to the nucleic acid-encoded polypeptide in a human population, human antibodies are purified by methods well known in the art. Preferably, the antibodies are affinity purified by passing antiserum over a column to which a nucleic acid-encoded protein, polypeptide, or fusion protein is bound. The bound antibodies can then be eluted from the column, for example using a buffer with a high salt concentration.

In addition to the antibodies discussed above, genetically engineered antibody derivatives are made, such as single chain antibodies.

Antibodies may be made by using standard protocols known in the art (See, for example, *Antibodies: A Laboratory Manual* ed. by Harlow and Lane (Cold Spring Harbor Press: 1988)). A mammal, such as a mouse, hamster, or rabbit can be immunized with an immunogenic form of the peptide (e.g., a mammalian polypeptide or an antigenic fragment which is capable of eliciting an antibody response, or a fusion protein as described above).

In one aspect, this invention includes monoclonal antibodies that show a subject polypeptide is highly expressed in colorectal tissue or tumor tissue, especially colon cancer tissue or colon cancer-derived cell lines. Therefore, in one embodiment, this invention provides a diagnostic tool for the analysis of expression of a subject polypeptide in general, and in particular, as a diagnostic for colon cancer.

Techniques for conferring immunogenicity on a protein or peptide include conjugation to carriers or other techniques well known in the art. An immunogenic portion of a protein can be administered in the presence of adjuvant. The progress of immunization can be monitored by detection of antibody titers in plasma or serum. Standard ELISA or other immunoassays can be used with the immunogen as antigen to assess the levels of antibodies. In a preferred embodiment, the subject antibodies are immunospecific for antigenic determinants of a protein of a mammal, e.g., antigenic determinants of a protein encoded by one of SEQ ID Nos. 1-544 or closely related homologs (e.g., at least 90% identical, and more preferably at least 95% identical).

Following immunization of an animal with an antigenic preparation of a polypeptide, antisera can be obtained and, if desired, polyclonal antibodies isolated

from the serum. To produce monoclonal antibodies, antibody-producing cells (lymphocytes) can be harvested from an immunized animal and fused by standard somatic cell fusion procedures with immortalizing cells such as myeloma cells to yield hybridoma cells. Such techniques are well known in the art, and include, for example, the hybridoma technique (originally developed by Kohler and Milstein, (1975) *Nature*, 256: 495-497), the human B cell hybridoma technique (Kozbar *et al.*, (1983) *Immunology Today*, 4: 72), and the EBV-hybridoma technique to produce human monoclonal antibodies (Cole *et al.*, (1985) *Monoclonal Antibodies and Cancer Therapy*, Alan R. Liss, Inc. pp. 77-96). Hybridoma cells can be screened immunochemically for production of antibodies specifically reactive with a polypeptide of the present invention and monoclonal antibodies isolated from a culture comprising such hybridoma cells.

The term antibody as used herein is intended to include fragments thereof which are also specifically reactive with one of the subject polypeptides. Antibodies can be fragmented using conventional techniques and the fragments screened for utility in the same manner as described above for whole antibodies. For example, F(ab)₂ fragments can be generated by treating antibody with pepsin. The resulting F(ab)₂ fragment can be treated to reduce disulfide bridges to produce Fab fragments. The antibody of the present invention is further intended to include bispecific, single-chain, and chimeric and humanized molecules having affinity for a polypeptide conferred by at least one CDR region of the antibody. In preferred embodiments, the antibodies, the antibody further comprises a label attached thereto and able to be detected, (e.g., the label can be a radioisotope, fluorescent compound, chemiluminescent compound, enzyme, or enzyme co-factor).

Antibodies can be used, e.g., to monitor protein levels in an individual for determining, e.g., whether a subject has a disease or condition, such as colon cancer, associated with an aberrant protein level, or allowing determination of the efficacy of a given treatment regimen for an individual afflicted with such a disorder. The level of polypeptides may be measured from cells in bodily fluid, such as in blood samples.

Another application of antibodies of the present invention is in the immunological screening of cDNA libraries constructed in expression vectors such as gt11, gt18-23, ZAP, and ORF8. Messenger libraries of this type, having coding sequences inserted in the correct reading frame and orientation, can produce fusion

proteins. For instance, gtl 1 will produce fusion proteins whose amino termini consist of β -galactosidase amino acid sequences and whose carboxyl termini consist of a foreign polypeptide. Antigenic epitopes of a protein, e.g., other orthologs of a particular protein or other paralogs from the same species, can then be detected with
5 antibodies, as, for example, reacting nitrocellulose filters lifted from infected plates with antibodies. Positive phage detected by this assay can then be isolated from the infected plate. Thus, the presence of homologs can be detected and cloned from other animals, as can alternate isoforms (including splicing variants) from humans.

In another embodiment, a panel of monoclonal antibodies may be used,
10 wherein each of the epitope's involved functions are represented by a monoclonal antibody. Loss or perturbation of binding of a monoclonal antibody in the panel would be indicative of a mutational alteration of the protein and thus of the corresponding gene.

15 C. Differential Expression

The present invention also provides a method to identify abnormal or diseased tissue in a human. For nucleic acids corresponding to profiles of protein families as described above, the choice of tissue may be dictated by the putative biological function. The expression of a gene corresponding to a specific nucleic acid is
20 compared between a first tissue that is suspected of being diseased and a second, normal tissue of the human. The normal tissue is any tissue of the human, especially those that express the target gene including, but not limited to, brain, thymus, testis, heart, prostate, placenta, spleen, small intestine, skeletal muscle, pancreas, and the mucosal lining of the colon.

25 The tissue suspected of being abnormal or diseased can be derived from a different tissue type of the human, but preferably it is derived from the same tissue type; for example an intestinal polyp or other abnormal growth should be compared with normal intestinal tissue. A difference between the target gene, mRNA, or protein in the two tissues which are compared, for example in molecular weight, amino acid
30 or nucleotide sequence, or relative abundance, indicates a change in the gene, or a gene which regulates it, in the tissue of the human that was suspected of being diseased.

The target genes in the two tissues are compared by any means known in the art. For example, the two genes are sequenced, and the sequence of the gene in the tissue suspected of being diseased is compared with the gene sequence in the normal tissue. The target genes, or portions thereof, in the two tissues are amplified, for
5 example using nucleotide primers based on the nucleotide sequence shown in the Sequence Listing, using the polymerase chain reaction. The amplified genes or portions of genes are hybridized to nucleotide probes selected from a corresponding nucleotide sequence shown SEQ ID No. 1-544. A difference in the nucleotide sequence of the target gene in the tissue suspected of being diseased compared with
10 the normal nucleotide sequence suggests a role of the nucleic acid-encoded proteins in the disease, and provides a lead for preparing a therapeutic agent. The nucleotide probes are labeled by a variety of methods, such as radiolabeling, biotinylation, or labeling with fluorescent or chemiluminescent tags, and detected by standard methods known in the art.

15 Alternatively, target mRNA in the two tissues is compared. PolyA⁺ RNA is isolated from the two tissues as is known in the art. For example, one of skill in the art can readily determine differences in the size or amount of target mRNA transcripts between the two tissues using Northern blots and nucleotide probes selected from the nucleotide sequence shown in the Sequence Listing. Increased or decreased
20 expression of a target mRNA in a tissue sample suspected of being diseased, compared with the expression of the same target mRNA in a normal tissue, suggests that the expressed protein has a role in the disease, and also provides a lead for preparing a therapeutic agent.

Any method for analyzing proteins is used to compare two nucleic acid-
25 encoded proteins from matched samples. The sizes of the proteins in the two tissues are compared, for example, using antibodies of the present invention to detect nucleic acid-encoded proteins in Western blots of protein extracts from the two tissues. Other changes, such as expression levels and subcellular localization, can also be detected immunologically, using antibodies to the corresponding protein. A higher or lower
30 level of nucleic acid-encoded protein expression in a tissue suspected of being diseased, compared with the same nucleic acid-encoded protein expression level in a normal tissue, is indicative that the expressed protein has a role in the disease, and provides another lead for preparing a therapeutic agent.

Similarly, comparison of gene sequences or of gene expression products, e.g., mRNA and protein, between a human tissue that is suspected of being diseased and a normal tissue of a human, are used to follow disease progression or remission in the human. Such comparisons of genes, mRNA, or protein are made as described above.

5 For example, increased or decreased expression of the target gene in the tissue suspected of being neoplastic can indicate the presence of neoplastic cells in the tissue. The degree of increased expression of the target gene in the neoplastic tissue relative to expression of the gene in normal tissue, or differences in the amount of increased expression of the target gene in the neoplastic tissue over time, is used to
10 assess the progression of the neoplasia in that tissue or to monitor the response of the neoplastic tissue to a therapeutic protocol over time.

The expression pattern of any two cell types can be compared, such as low and high metastatic tumor cell lines, or cells from tissue which have and have not been exposed to a therapeutic agent. A genetic predisposition to disease in a human is
15 detected by comparing an target gene, mRNA, or protein in a fetal tissue with a normal target gene, mRNA, or protein. Fetal tissues that are used for this purpose include, but are not limited to, amniotic fluid, chorionic villi, blood, and the blastomere of an in vitro-fertilized embryo. The comparable normal target gene is obtained from any tissue. The mRNA or protein is obtained from a normal tissue of a
20 human in which the target gene is expressed. Differences such as alterations in the nucleotide sequence or size of the fetal target gene or mRNA, or alterations in the molecular weight, amino acid sequence, or relative abundance of fetal target protein, can indicate a germline mutation in the target gene of the fetus, which indicates a genetic predisposition to disease.

25

D. Use of Nucleic Acids, and Encoded Polypeptides to Screen for Peptide
Analogues and Antagonists

Polypeptides encoded by the instant nucleic acids, e.g., SEQ ID Nos. 1-544,
30 preferably SEQ ID Nos. 1-168, even more preferably SEQ ID Nos. 1-35, or a sequence complementary thereto, and corresponding full length genes can be used to screen peptide libraries to identify binding partners, such as receptors, from among the encoded polypeptides.

A library of peptides may be synthesized following the methods disclosed in U.S. Pat. No. 5,010,175, and in PCT WO 91/17823. As described below in brief, one prepares a mixture of peptides, which is then screened to identify the peptides exhibiting the desired signal transduction and receptor binding activity. In the '175 method, a suitable peptide synthesis support (e.g., a resin) is coupled to a mixture of appropriately protected, activated amino acids. The concentration of each amino acid in the reaction mixture is balanced or adjusted in inverse proportion to its coupling reaction rate so that the product is an equimolar mixture of amino acids coupled to the starting resin. The bound amino acids are then deprotected, and reacted with another balanced amino acid mixture to form an equimolar mixture of all possible dipeptides. This process is repeated until a mixture of peptides of the desired length (e.g., hexamers) is formed. Note that one need not include all amino acids in each step: one may include only one or two amino acids in some steps (e.g., where it is known that a particular amino acid is essential in a given position), thus reducing the complexity of the mixture. After the synthesis of the peptide library is completed, the mixture of peptides is screened for binding to the selected polypeptide. The peptides are then tested for their ability to inhibit or enhance activity. Peptides exhibiting the desired activity are then isolated and sequenced.

The method described in WO 91/17823 is similar. However, instead of reacting the synthesis resin with a mixture of activated amino acids, the resin is divided into twenty equal portions (or into a number of portions corresponding to the number of different amino acids to be added in that step), and each amino acid is coupled individually to its portion of resin. The resin portions are then combined, mixed, and again divided into a number of equal portions for reaction with the second amino acid. In this manner, each reaction may be easily driven to completion. Additionally, one may maintain separate "subpools" by treating portions in parallel, rather than combining all resins at each step. This simplifies the process of determining which peptides are responsible for any observed receptor binding or signal transduction activity.

In such cases, the subpools containing, e.g., 1-2,000 candidates each are exposed to one or more polypeptides of the invention. Each subpool that produces a positive result is then resynthesized as a group of smaller subpools (sub-subpools) containing, e.g., 20-100 candidates, and reassayed. Positive sub-subpools may be

resynthesized as individual compounds, and assayed finally to determine the peptides that exhibit a high binding constant. These peptides can be tested for their ability to inhibit or enhance the native activity. The methods described in WO 91/7823 and U.S. Patent No. 5,194,392 (herein incorporated by reference) enable the preparation of
5 such pools and subpools by automated techniques in parallel, such that all synthesis and resynthesis may be performed in a matter of days.

Peptide agonists or antagonists are screened using any available method, such as signal transduction, antibody binding, receptor binding, mitogenic assays, chemotaxis assays, etc. The methods described herein are presently preferred. The
10 assay conditions ideally should resemble the conditions under which the native activity is exhibited *in vivo*, that is, under physiologic pH, temperature, and ionic strength. Suitable agonists or antagonists will exhibit strong inhibition or enhancement of the native activity at concentrations that do not cause toxic side effects in the subject. Agonists or antagonists that compete for binding to the native
15 polypeptide may require concentrations equal to or greater than the native concentration, while inhibitors capable of binding irreversibly to the polypeptide may be added in concentrations on the order of the native concentration.

The end results of such screening and experimentation will be at least one novel polypeptide binding partner, such as a receptor, encoded by a nucleic acid of the
20 invention, and at least one peptide agonist or antagonist of the novel binding partner. Such agonists and antagonists can be used to modulate, enhance, or inhibit receptor function in cells to which the receptor is native, or in cells that possess the receptor as a result of genetic engineering. Further, if the novel receptor shares biologically important characteristics with a known receptor, information about agonist/antagonist
25 binding may help in developing improved agonists/antagonists of the known receptor.

E. Pharmaceutical Compositions and Therapeutic Uses

Pharmaceutical compositions can comprise polypeptides, antibodies, or polynucleotides of the claimed invention. The pharmaceutical compositions will
30 comprise a therapeutically effective amount of either polypeptides, antibodies, or polynucleotides of the claimed invention.

The term "therapeutically effective amount" as used herein refers to an amount of a therapeutic agent to treat, ameliorate, or prevent a desired disease or condition, or

to exhibit a detectable therapeutic or preventative effect. The effect can be detected by, for example, chemical markers or antigen levels. Therapeutic effects also include reduction in physical symptoms, such as decreased body temperature. The precise effective amount for a subject will depend upon the subject's size and health, the
5 nature and extent of the condition, and the therapeutics or combination of therapeutics selected for administration. Thus, it is not useful to specify an exact effective amount in advance. However, the effective amount for a given situation can be determined by routine experimentation and is within the judgment of the clinician.

For purposes of the present invention, an effective dose will be from about
10 0.01 mg/kg to 50 mg/kg or 0.05 mg/kg to about 10 mg/kg of the DNA constructs in the individual to which it is administered.

A pharmaceutical composition can also contain a pharmaceutically acceptable carrier. The term "pharmaceutically acceptable carrier" refers to a carrier for administration of a therapeutic agent, such as antibodies or a polypeptide, genes, and
15 other therapeutic agents. The term refers to any pharmaceutical carrier that does not itself induce the production of antibodies harmful to the individual receiving the composition, and which may be administered without undue toxicity. Suitable carriers may be large, slowly metabolized macromolecules such as proteins, polysaccharides, polylactic acids, polyglycolic acids, polymeric amino acids, amino
20 acid copolymers, and inactive virus particles. Such carriers are well known to those of ordinary skill in the art.

Pharmaceutically acceptable salts can be used therein, for example, mineral acid salts such as hydrochlorides, hydrobromides, phosphates, sulfates, and the like; and the salts of organic acids such as acetates, propionates, malonates, benzoates, and
25 the like. A thorough discussion of pharmaceutically acceptable excipients is available in *Remington's Pharmaceutical Sciences* (Mack Pub. Co., N.J. 1991).

Pharmaceutically acceptable carriers in therapeutic compositions may contain liquids such as water, saline, glycerol and ethanol. Additionally, auxiliary substances, such as wetting or emulsifying agents, pH buffering substances, and the like, may be
30 present in such vehicles. Typically, the therapeutic compositions are prepared as injectables, either as liquid solutions or suspensions; solid forms suitable for solution in, or suspension in, liquid vehicles prior to injection may also be prepared. Liposomes are included within the definition of a pharmaceutically acceptable carrier.

Delivery Methods

Once formulated, the nucleic acid compositions of the invention can be (1) administered directly to the subject; (2) delivered ex vivo, to cells derived from the subject; or (3) delivered in vitro for expression of recombinant proteins.

Direct delivery of the compositions will generally be accomplished by injection, either subcutaneously, intraperitoneally, intravenously or intramuscularly, or delivered to the interstitial space of a tissue. The compositions can also be administered into a tumor or lesion. Other modes of administration include oral and pulmonary administration, suppositories, and transdermal applications, needles, and gene guns or hyposprays. Dosage treatment may be a single dose schedule or a multiple dose schedule.

Methods for the ex vivo delivery and reimplantation of transformed cells into a subject are known in the art and described in e.g., International Publication No. WO 93/14778. Examples of cells useful in ex vivo applications include, for example, stem cells, particularly hematopoietic, lymph cells, macrophages, dendritic cells, or tumor cells.

Generally, delivery of nucleic acids for both ex vivo and in vitro applications can be accomplished by, for example, dextran-mediated transfection, calcium phosphate precipitation, polybrene mediated transfection, protoplast fusion, electroporation, encapsulation of the polynucleotide(s) in liposomes, and direct microinjection of the DNA into nuclei, all well known in the art.

Once a subject gene has been found to correlate with a proliferative disorder, such as neoplasia, dysplasia, and hyperplasia, the disorder may be amenable to treatment by administration of a therapeutic agent based on the nucleic acid or corresponding polypeptide.

Preparation of antisense polypeptides is discussed above. Neoplasias that are treated with the antisense composition include, but are not limited to, cervical cancers, melanomas, colorectal adenocarcinomas, Wilms' tumor, retinoblastoma, sarcomas, myosarcomas, lung carcinomas, leukemias, such as chronic myelogenous leukemia, promyelocytic leukemia, monocytic leukemia, and myeloid leukemia, and lymphomas, such as histiocytic lymphoma. Proliferative disorders that are treated with the therapeutic composition include disorders such as anhydric hereditary

ectodermal dysplasia, congenital alveolar dysplasia, epithelial dysplasia of the cervix, fibrous dysplasia of bone, and mammary dysplasia. Hyperplasias, for example, endometrial, adrenal, breast, prostate, or thyroid hyperplasias or pseudoepitheliomatous hyperplasia of the skin, are treated with antisense therapeutic compositions. Even in disorders in which mutations in the corresponding gene are not implicated, downregulation or inhibition of nucleic acid-related gene expression can have therapeutic application. For example, decreasing nucleic acid-related gene expression can help to suppress tumors in which enhanced expression of the gene is implicated.

Both the dose of the antisense composition and the means of administration are determined based on the specific qualities of the therapeutic composition, the condition, age, and weight of the patient, the progression of the disease, and other relevant factors. Administration of the therapeutic antisense agents of the invention includes local or systemic administration, including injection, oral administration, particle gun or catheterized administration, and topical administration. Preferably, the therapeutic antisense composition contains an expression construct comprising a promoter and a polynucleotide segment of at least about 12, 22, 25, 30, or 35 contiguous nucleotides of the antisense strand of a nucleic acid. Within the expression construct, the polynucleotide segment is located downstream from the promoter, and transcription of the polynucleotide segment initiates at the promoter.

Various methods are used to administer the therapeutic composition directly to a specific site in the body. For example, a small metastatic lesion is located and the therapeutic composition injected several times in several different locations within the body of tumor. Alternatively, arteries which serve a tumor are identified, and the therapeutic composition injected into such an artery, in order to deliver the composition directly into the tumor. A tumor that has a necrotic center is aspirated and the composition injected directly into the now empty center of the tumor. The antisense composition is directly administered to the surface of the tumor, for example, by topical application of the composition. X-ray imaging is used to assist in certain of the above delivery methods.

Receptor-mediated targeted delivery of therapeutic compositions containing an antisense polynucleotide, subgenomic polynucleotides, or antibodies to specific tissues is also used. Receptor-mediated DNA delivery techniques are described in, for

example, Findeis *et al.*, *Trends in Biotechnol.* (1993) 11:202-205; Chiou *et al.*, (1994) *Gene Therapeutics: Methods And Applications Of Direct Gene Transfer* (J.A. Wolff, ed.); Wu & Wu, *J. Biol. Chem.* (1988) 263:621-24; Wu *et al.*, *J. Biol. Chem.* (1994) 269:542-46; Zenke *et al.*, *Proc. Natl. Acad. Sci. (USA)* (1990) 87:3655-59; Wu *et al.*,
5 *J. Biol. Chem.* (1991) 266:338-42. Preferably, receptor-mediated targeted delivery of therapeutic compositions containing antibodies of the invention is used to deliver the antibodies to specific tissue.

Therapeutic compositions containing antisense subgenomic polynucleotides are administered in a range of about 100 ng to about 200 mg of DNA for local
10 administration in a gene therapy protocol. Concentration ranges of about 500 ng to about 50 mg, about 1 mg to about 2 mg, about 5 mg to about 500 mg, and about 20 mg to about 100 mg of DNA can also be used during a gene therapy protocol. Factors such as method of action and efficacy of transformation and expression are considerations which will affect the dosage required for ultimate efficacy of the
15 antisense subgenomic nucleic acids. Where greater expression is desired over a larger area of tissue, larger amounts of antisense subgenomic nucleic acids or the same amounts readministered in a successive protocol of administrations, or several administrations to different adjacent or close tissue portions of, for example, a tumor site, may be required to effect a positive therapeutic outcome. In all cases, routine
20 experimentation in clinical trials will determine specific ranges for optimal therapeutic effect. A more complete description of gene therapy vectors, especially retroviral vectors, is contained in U.S. Serial No. 08/869,309, which is expressly incorporated herein, and in section F below.

For genes encoding polypeptides or proteins with anti-inflammatory activity,
25 suitable use, doses, and administration are described in U.S. Patent No. 5,654,173, incorporated herein by reference. Therapeutic agents also include antibodies to proteins and polypeptides encoded by the subject nucleic acids, as described in U.S. Patent No. 5,654,173.

30 F. Gene Therapy

The therapeutic nucleic acids of the present invention may be utilized in gene delivery vehicles. The gene delivery vehicle may be of viral or non-viral origin (see generally, Jolly, *Cancer Gene Therapy* (1994) 1:51-64; Kimura, *Human Gene*

Therpay (1994) 5:845-852; Connelly, *Human Gene Therapy* (1995) 1:185-193; and Kaplitt, *Nature Genetics* (1994) 6:148-153). Gene therapy vehicles for delivery of constructs including a coding sequence of a therapeutic of the invention can be administered either locally or systemically. These constructs can utilize viral or non-
5 viral vector approaches. Expression of such coding sequences can be induced using endogenous mammalian or heterologous promoters. Expression of the coding sequence can be either constitutive or regulated.

The present invention can employ recombinant retroviruses which are constructed to carry or express a selected nucleic acid molecule of interest. Retrovirus
10 vectors that can be employed include those described in EP 0 415 731; WO 90/07936; WO 94/03622; WO 93/25698; WO 93/25234; U.S. Patent No. 5, 219,740; WO 93/11230; WO 93/10218; Vile and Hart, *Cancer Res.* (1993) 53:3860-3864; Vile and Hart, *Cancer Res.* (1993) 53:962-967; Ram et al., *Cancer Res.* (1993) 53:83-88; Takamiya et al., *J. Neurosci. Res.* (1992) 33:493-503; Baba et al., *J. Neurosurg.*
15 (1993) 79:729-735; U.S. Patent no. 4,777,127; GB Patent No. 2,200,651; and EP 0 345 242. Preferred recombinant retroviruses include those described in WO 91/02805.

Packaging cell lines suitable for use with the above-described retroviral vector constructs may be readily prepared (see PCT publications WO 95/30763 and WO
20 92/05266), and used to create producer cell lines (also termed vector cell lines) for the production of recombinant vector particles. Within particularly preferred embodiments of the invention, packaging cell lines are made from human (such as HT1080 cells) or mink parent cell lines, thereby allowing production of recombinant retroviruses that can survive inactivation in human serum.

25 The present invention also employs alphavirus-based vectors that can function as gene delivery vehicles. Such vectors can be constructed from a wide variety of alphaviruses, including, for example, Sindbis virus vectors, Semliki forest virus (ATCC VR-67; ATCC VR-1247), Ross River virus (ATCC VR-373; ATCC VR-1246) and Venezuelan equine encephalitis virus (ATCC VR-923; ATCC VR-1250;
30 ATCC VR 1249; ATCC VR-532). Representative examples of such vector systems include those described in U.S. Patent Nos. 5,091,309; 5,217,879; and 5,185,440; and PCT Publication Nos. WO 92/10578; WO 94/21792; WO 95/27069; WO 95/27044; and WO 95/07994.

Gene delivery vehicles of the present invention can also employ parvovirus such as adeno-associated virus (AAV) vectors. Representative examples include the AAV vectors disclosed by Srivastava in WO 93/09239, Samulski et al., *J. Vir.* (1989) 63:3822-3828; Mendelson et al., *Virol.* (1988) 166:154-165; and Flotte et al., *PNAS* 5 (1993) 90:10613-10617.

Representative examples of adenoviral vectors include those described by Berkner, *Biotechniques* (1988) 6:616-627; Rosenfeld et al., *Science* (1991) 252:431-434; WO 93/19191; Kolls et al., *PNAS* (1994) 91:215-219; Kass-Eisler et al., *PNAS* (1993) 90:11498-11502; Guzman et al., *Circulation* (1993) 88:2838-2848; Guzman et 10 al., *Cir. Res.* (1993) 73:1202-1207; Zabner et al., *Cell* (1993) 75:207-216; Li et al., *Hum. Gene Ther.* (1993) 4:403-409; Cailaud et al., *Eur. J. Neurosci.* (1993) 5:1287-1291; Vincent et al., *Nat. Genet.* (1993) 5:130-134; Jaffe et al., *Nat. Genet.* (1992) 1:372-378; and Levrero et al., *Gene* (1991) 101:195-202. Exemplary adenoviral gene therapy vectors employable in this invention also include those described in WO 15 94/12649, WO 93/03769; WO 93/19191; WO 94/28938; WO 95/11984 and WO 95/00655. Administration of DNA linked to killed adenovirus as described in Curiel, *Hum. Gene Ther.* (1992) 3:147-154 may be employed.

Other gene delivery vehicles and methods may be employed, including polycationic condensed DNA linked or unlinked to killed adenovirus alone, for 20 example Curiel, *Hum. Gene Ther.* (1992) 3:147-154; ligand linked DNA, for example see Wu, *J. Biol. Chem.* (1989) 264:16985-16987; eukaryotic cell delivery vehicles cells, for example see U.S. Serial No. 08/240,030, filed May 9, 1994, and U.S. Serial No. 08/404,796; deposition of photopolymerized hydrogel materials; hand-held gene transfer particle gun, as described in U.S. Patent No. 5,149,655; ionizing radiation as 25 described in U.S. Patent No. 5,206,152 and in WO92/11033; nucleic charge neutralization or fusion with cell membranes. Additional approaches are described in Philip, *Mol. Cell Biol.* (1994) 14:2411-2418, and in Woffendin, *Proc. Natl. Acad. Sci.* (1994) 91:1581-1585.

Naked DNA may also be employed. Exemplary naked DNA introduction 30 methods are described in WO 90/11092 and U.S. Patent No. 5,580,859. Uptake efficiency may be improved using biodegradable latex beads. DNA coated latex beads are efficiently transported into cells after endocytosis initiation by the beads. The method may be improved further by treatment of the beads to increase

hydrophobicity and thereby facilitate disruption of the endosome and release of the DNA into the cytoplasm. Liposomes that can act as gene delivery vehicles are described in U.S. Patent No. 5,422,120, PCT Nos. WO 95/13796, WO 94/23697, and WO 91/14445, and EP No. 0 524 968.

5 Further non-viral delivery suitable for use includes mechanical delivery systems such as the approach described in Woffendin *et al.*, *Proc. Natl. Acad. Sci. USA* (1994) 91(24):11581-11585. Moreover, the coding sequence and the product of expression of such can be delivered through deposition of photopolymerized hydrogel materials. Other conventional methods for gene delivery that can be used for delivery
10 of the coding sequence include, for example, use of hand-held gene transfer particle gun, as described in U.S. Patent No. 5,149,655; use of ionizing radiation for activating transferred gene, as described in U.S. Patent No. 5,206,152 and PCT No. WO 92/11033.

15 G. Transgenic Animals

One aspect of the present invention relates to transgenic non-human animals having germline and/or somatic cells in which the biological activity of one or more genes are altered by a chromosomally incorporated transgene.

In a preferred embodiment, the transgene encodes a mutant protein, such as
20 dominant negative protein which antagonizes at least a portion of the biological function of a wild-type protein.

Yet another preferred transgenic animal includes a transgene encoding an antisense transcript which, when transcribed from the transgene, hybridizes with a gene or a mRNA transcript thereof, and inhibits expression of the gene.

25 In one embodiment, the present invention provides a desired non-human animal or an animal (including human) cell which contains a predefined, specific and desired alteration rendering the non-human animal or animal cell predisposed to cancer. Specifically, the invention pertains to a genetically altered non-human animal (most preferably, a mouse), or a cell (either non-human animal or human) in culture,
30 that is defective in at least one of two alleles of a tumor-suppressor gene. The inactivation of at least one of these tumor suppressor alleles results in an animal with a higher susceptibility to tumor induction or other proliferative or differentiative disorders, or disorders marked by aberrant signal transduction, e.g., from a cytokine or

growth factor. A genetically altered mouse of this type is able to serve as a useful model for hereditary cancers and as a test animal for carcinogen studies. The invention additionally pertains to the use of such non-human animals or animal cells, and their progeny in research and medicine.

5 Furthermore, it is contemplated that cells of the transgenic animals of the present invention can include other transgenes, e.g., which alter the biological activity of a second tumor suppressor gene or an oncogene. For instance, the second transgene can functionally disrupt the biological activity of a second tumor suppressor gene, such as p53, p73, DCC, p21^{cip1}, p27^{kip1}, Rb, Mad or E2F. Alternatively, the
10 second transgene can cause overexpression or loss of regulation of an oncogene, such as ras, myc, a cdc25 phosphatase, Bcl-2, Bcl-6, a transforming growth factor, neu, int-3, polyoma virus middle T antigen, SV40 large T antigen, a papillomaviral E6 protein, a papillomaviral E7 protein, CDK4, or cyclin D1.

 A preferred transgenic non-human animal of the present invention has
15 germline and/or somatic cells in which one or more alleles of a gene are disrupted by a chromosomally incorporated transgene, wherein the transgene includes a marker sequence providing a detectable signal for identifying the presence of the transgene in cells of the transgenic animal, and replaces at least a portion of the gene or is inserted into the gene or disrupts expression of a wild-type protein.

20 Still another aspect of the present invention relates to methods for generating non-human animals and stem cells having a functionally disrupted endogenous gene. In a preferred embodiment, the method comprises the steps of:

- (i) constructing a transgene construct including (a) a recombination region having at least a portion of the gene, which recombination region directs
25 recombination of the transgene with the gene, and (b) a marker sequence which provides a detectable signal for identifying the presence of the transgene in a cell;
- (ii) transferring the transgene into stem cells of a non-human animal;
- (iii) selecting stem cells having a correctly targeted homologous recombination
30 between the transgene and the gene;
- (iv) transferring cells identified in step (iii) into a non-human blastocyst and implanting the resulting chimeric blastocyst into a non-human female; and

- (v) collecting offspring harboring an endogenous gene allele having the correctly targeted recombination.

Yet another aspect of the invention provides a method for evaluating the carcinogenic potential of an agent by (i) contacting a transgenic animal of the present invention with a test agent, and (ii) comparing the number of transformed cells in a sample from the treated animal with the number of transformed cells in a sample from an untreated transgenic animal or transgenic animal treated with a control agent. The difference in the number of transformed cells in the treated animal, relative to the number of transformed cells in the absence of treatment with a control agent, indicates the carcinogenic potential of the test compound.

Another aspect of the invention provides a method of evaluating an anti-proliferative activity of a test compound. In preferred embodiments, the method includes contacting a transgenic animal of the present invention, or a sample of cells from such animal, with a test agent, and determining the number of transformed cells in a specimen from the transgenic animal or in the sample of cells. A statistically significant decrease in the number of transformed cells, relative to the number of transformed cells in the absence of the test agent, indicates the test compound is a potential anti-proliferative agent.

The practice of the present invention will employ, unless otherwise indicated, conventional techniques of cell biology, cell culture, molecular biology, transgenic biology, microbiology, recombinant DNA, and immunology, which are within the skill of the art. Such techniques are explained fully in the literature. See, for example, *Molecular Cloning A Laboratory Manual*, 2nd Ed., ed. by Sambrook, Fritsch and Maniatis (Cold Spring Harbor Laboratory Press:1989); *DNA Cloning*, Volumes I and II (D. N. Glover ed., 1985); *Oligonucleotide Synthesis* (M. J. Gait ed., 1984); Mullis *et al.* U.S. Patent No. 4,683,195; *Nucleic Acid Hybridization* (B.D. Hames & S. J. Higgins eds. 1984); *Transcription And Translation* (B. D. Hames & S. J. Higgins eds. 1984); *Culture Of Animal Cells* (R. I. Freshney, Alan R. Liss, Inc., 1987); *Immobilized Cells And Enzymes* (IRL Press, 1986); B. Perbal, *A Practical Guide To Molecular Cloning* (1984); the treatise, *Methods In Enzymology* (Academic Press, Inc., N.Y.); *Gene Transfer Vectors For Mammalian Cells* (J. H. Miller and M. P. Calos eds., 1987, Cold Spring Harbor Laboratory); *Methods In Enzymology*, Vols. 154 and 155 (Wu *et al.* eds.), *Immunochemical Methods In Cell And Molecular*

Biology (Mayer and Walker, eds., Academic Press, London, 1987); *Handbook Of Experimental Immunology*, Volumes I-IV (D. M. Weir and C. C. Blackwell, eds., 1986); *Manipulating the Mouse Embryo*, (Cold Spring Harbor Laboratory Press, Cold Spring Harbor, N.Y., 1986).

5 As mentioned above, the sequences described herein are believed to have particular utility in regards to colon cancer. However, they may also be useful with other types of cancers and other disease states.

10 The present invention will now be illustrated by reference to the following examples which set forth particularly advantageous embodiments. However, it should be noted that these embodiments are illustrative and are not to be construed as restricting the invention in any way.

XI. Examples

A. Identification of differentially expressed sequences.

15

Description of the Libraries

SEQ ID Nos: 1-544 were derived from libraries designated as DE and PA as described below. The DE library is a normalized, colon cancer specific, subtracted cDNA library. The DE library is specific for sequences expressed in colon cancer
20 [proximal and distal Dukes' B, microsatellite instability negative (MSI-)] but not expressed in normal tissues, including normal colon tissue. The PA library is a normalized, colon specific, subtracted cDNA library. The PA library is specific for sequences expressed in normal colon tissue but not expressed in other normal tissues.

25 Construction of a colon cancer specific library

A subtracted colon cancer specific library was made by subtracting pooled proximal, stage B, MSI⁻ and distal, Stage B, MSI⁻ tumor tissue cDNA against a combination of pooled driver normal cDNA made from colon, peripheral blood leukocytes (PBL), liver, spleen, lung, kidney, heart, small intestine, skeletal muscle,
30 and prostate tissue cDNAs. The following RNA samples were obtained from Origene Technologies, Inc., Rockville, Maryland, and were used to synthesize the pooled driver cDNA: #HT-1015 normal colon total RNA, #HT-1005 liver total RNA, #HT-1004 spleen total RNA, #HT-1009 lung total RNA, #HT-1003 kidney total RNA,

#HT-1006 peripheral blood leukocyte total RNA, #HT-prostate total RNA, #HM-1002 heart muscle poly A+ RNA, #HM-1007 intestine poly A+ RNA, and #HM-1008 skeletal muscle poly A+ RNA. First-strand cDNA was prepared for each using 1 microgram of RNA. A biased pool of first-strand cDNA was prepared containing
5 50% normal colon first-strand cDNA reaction and 5.56% of each of the remaining tissue first-strand cDNA reactions by volume. Eight individual amplification reactions, each containing 1 microliter of the biased first-strand cDNA reaction pool, were performed for 18 cycles. The double stranded cDNA product from all eight amplification reactions were pooled and purified for subsequent use in subtractive
10 hybridization. The colon cancer specific subtracted library was called DE and individual clones derived from this library were referred to with a number prefixed by DE.

Normalized subtracted DE colon cancer specific and pooled normal human tissue specific cDNA libraries (same as components of driver cDNA above) were
15 generated according published procedures (Daitschenko et al., 1996 PNAS 93:6025-6030, Gurskaya et al., 1996 Analytical Biochemistry 240:90-97) using Clontech Laboratories, Inc., PCR-Select cDNA subtraction kit, PT1117-1. A forty-five fold mass excess of driver cDNA (450 nanograms) was used for each subtraction experiment. Subtractive hybridization of tester with driver cDNAs was performed
20 twice, each time for about 8 -12 hours. Subtracted cancer specific DE cDNA was ligated into the pCR2.1-TOPO plasmid vector (Invitrogen Corporation, Carlsbad CA) and chemically transformed into ultracompetent Epicurian E. coli XL10-Gold cells (Stratagene, La Jolla, CA). A reverse library was also constructed wherein the tester and driver samples were switched; this library was designated as MD.

25

Construction of a normal colon specific library

This normal colon tissue specific library was made using Clontech Laboratories Inc PCR-Select kit, K1804-1, following instructions from the users manual (PT1117-1).

30 Four, 100 µl, SMART PCR cDNA amplification reactions for each normal, non-cancerous, patient sample, were performed, starting with 1 µl from their respective first strand cDNA reactions. Each sample was amplified for only 18 cycles using the following PCR conditions; 95 C-10 sec, 68 C 5 min. using a 9600 Perkin

Elmer instrument. The following are Bayer Diagnostic sample identification numbers for the cDNA samples that were amplified: NPB(-) 27347, NPB(-)27859, NPB(-)28147, NPB(-)28162, NDB(-)28800, NDB(-)29243, NDB(-)29244 and NDB(-)42472. These are normal colon tissue samples obtained from the same patients providing the proximal stage B MSI – and distal stage B MSI- cancer samples, which were used to prepare the DE library described above. Equal volumes of the eight normal colon cDNAs were pooled. A subtracted normal colon tissue specific library was made by subtracting the normal colon cDNA pool against a combination of pooled driver normal cDNA made from peripheral blood leukocytes (PBL), liver, spleen, lung, kidney, heart, small intestine, skeletal muscle, and prostate tissue cDNAs. The following are the RNA samples that were used to synthesize the pooled driver cDNA: #HT-1005 liver total RNA, #HT-1004 spleen total RNA, #HT-1009 lung total RNA, #HT-1003 kidney total RNA, #HT-1006 peripheral blood leukocyte total RNA, #HT-prostate total RNA, #HM-1002 heart muscle poly A+ RNA, #HM-1007 intestine poly A+ RNA, and #HM-1008 skeletal muscle poly A+ RNA. First-strand cDNA was prepared for each using 1 microgram of RNA. A pool of first strand cDNA reactions was then made consisting of equal volumes of the nine driver tissue first-strand cDNA reactions. Eight individual amplification reactions, each containing 1 microliter of the first-strand cDNA reaction pool, were performed for 18 cycles. The double stranded cDNA product from all eight amplification reactions was pooled and purified for subsequent use in subtractive hybridization. The normal colon tissue specific subtracted library was called PA and individual clones derived from this library were referred to with a number prefixed by PA.

The normalized subtracted PA normal colon specific cDNA library and a subtracted normal human tissue specific cDNA library, consisting of the human tissues listed above were generated according published procedures (Daitchenko et al., 1996 PNAS 93:6025-6030, Gurskaya et al., 1996 Analytical Biochemistry 240:90-97) using Clontech Laboratories, Inc., PCR-Select cDNA subtraction kit, PT1117-1. Library construction and cloning were carried out as described above for the colon cancer specific library. Out of the 1152 clones that were analyzed for differential expression, approximately 69% were differentially expressed.

Each EST isolated from each of the above libraries represents a sequence from a partial mRNA transcript, since the cDNA used for making the subtracted library

was restricted with *RsaI*, a four base cutter restriction endonuclease that generates fragments with an average size of about 600 base pairs.

Validation of differential expression in colon cancer

5 To validate that the differentially expressed sequences found in this library were specific to colon cancer, the clones were screened with cDNAs prepared from a colon cancer specific library, Delaware (DE), and a normal tissue specific library Maryland (MD).

 cDNA clones were analyzed for differential expression following the procedure developed by von Stein et al., 1997, *Nucleic Acids Research* 25(13):2598-
10 2602 and using probes synthesized according to a published method (Jin et al., 1997, *Biotechniques* 23:1083-1086). Out of the 1248 clones that were analyzed for differential expression approximately 83% were differentially expressed.

Sequencing and analysis of differentially expressed clones

15 The nucleotide sequence of the inserts from clones shown to be differentially expressed was determined by single-pass sequencing from either the T7 or M13 promoter sites using fluorescently labeled dideoxynucleotides via the Sanger sequencing method. Sequences were analyzed according to methods described in the text (XI., Examples; B. Results of Public Database Search).

20 Each nucleic acid represents sequence from at least a partial mRNA transcript. The nucleic acids of the invention were assigned a sequence identification number (see attachments). The nucleic acid sequences are provided in the attached Sequence Listing.

 An example of an experiment to identify differentially expressed clones is
25 shown in the Figure, "Differential Expression Analysis". The inserts from subtracted clones were amplified, electrophoresed, and blotted on to membranes as described above. The gel was hybridized with *RSAI* cut DE and MD cDNA probes as described above.

 In the Figure, individual clones are designated by a number at the top of each
30 lane; the blots are aligned so that the same clone is represented in the same vertical lane in both the upper ("Cancer Probe") and lower ("Normal Probe") blot. Lanes labeled "O" indicate clones that are overexpressed, i.e., show a darker, more prominent band in the upper blot ("Cancer Probe") relative to that observed, in the

same lane, in the lower blot ("Normal Probe"). The Lane labeled "U" indicates a clone that is underexpressed, i.e., shows a darker, more prominent band in the lower blot ("Normal Probe") relative to that observed, in the same lane, in the upper blot ("Cancer Probe"). The lane labeled "M", indicates a clone that is marginally overexpressed in cancer and normal cells.

B. Results of Public Databases Searches

The nucleotide sequence of SEQ ID Nos. 1-544 were aligned with individual sequences that were publicly available. Genbank and divisions of GenBank, such as dbEST, CGAP, and Unigene were the primary databases used to perform the sequence similarity searches. The patent database, GENESEQ, was also utilized.

A total of 544 sequences were analyzed. The sequences were first masked to identify vector-derived sequences, which were subsequently removed. The remaining sequence information was used to create the Sequence Listing (SEQ ID Nos. 1-544). Each of these sequences was used as the query sequence to perform a Blast 2 search against the databases listed above. The Blast 2 search differs from the traditional Blast search in that it allows for the introduction of gaps in order to produce an optimal alignment of two sequences.

A proprietary algorithm was developed to utilize the output from the Blast 2 searches and categorize the sequences based upon high similarity (e value < 1e-40) or identity to entries contained in the GenBank and dbEST databases. Three categories were created as follows: 1) matches to known human genes, 2) matches to human EST sequences, and 3) no significant match to either 1 or 2, and therefore a potentially novel human sequence.

Those skilled in the art will recognize, or be able to ascertain, using not more than routine experimentation, many equivalents to the specific embodiments of the invention described herein. Such specific embodiments and equivalents are intended to be encompassed by the following claims.

All patents, published patent applications, and publications cited herein are incorporated by reference as if set forth fully herein.

TABLE 1

SEQ ID NO	clone name	Tissue Probe	SEQ ID NO	clone name	Tissue Probe
1	de0020t7	U	53	de0079t7	N
2	de0041t7	N	54	de0085t7	N
3	de0056t7	U	55	de0089t7	N
4	de0064t7	N	56	de0095t7	N
5	de0092t7	U	57	de0099t7	N
6	de0142t7	N	58	de0105t7	N
7	de0153t7	M	59	de0112t7	N
8	de0163t7	U	60	de0114t7	N
9	de0188t7	N	61	de0121t7	N
10	de0190t7	U	62	de0122t7	N
11	de0201t7	M	63	de0124t7	N
12	de0225t7	U	64	de0139t7	M
13	de0246t7	U	65	de0143t7	N
14	de0257t7	N	66	de0166t7	U
15	de0285t7	O	67	de0168t7	N
16	de0529t7	U	68	de0171t7	N
17	de0629t7	U	69	de0178t7	N
18	de0727t7	O	70	de0180t7	O
19	de0787t7	U	71	de0181t7	N
20	de0810t7	N	72	de0199t7	N
21	de0833t7	N	73	de0200t7	N
22	pa0107t7	U	74	de0202t7	N
23	pa0130t7	U	75	de0205t7	N
24	pa0149t7	U	76	de0207t7	U
25	pa0185t7	U	77	de0212t7	N
26	pa0203t7	U	78	de0217t7	N
27	pa0277t7	U	79	de0220t7	U
28	pa0287t7	U	80	de0228t7	N
29	pa0293t7*	U	81	de0236t7	O
30	pa0341t7	U	82	de0243t7	N
31	pa0357t7	N	83	de0253t7	O
32	pa0361t7	U	84	de0258t7	N
33	pa0404t7	U	85	de0259t7	N
34	pa0408t7	U	86	de0262t7	N
35	pa0425t7	N	87	de0270t7	N
36	de0001t7	N	88	de0275t7	N
37	de0002t7	N	89	de0287t7	N
38	de0036t7	N	90	de0288t7	N
39	de0038t7	M	91	de0306t7	N
40	de0040t7	N	92	de0490t7	N
41	de0043t7	O	93	de0501t7	M
42	de0044t7	N	94	de0516t7	N
43	de0045t7	N	95	de0589t7	N
44	de0050t7	N	96	de0596t7	U
45	de0052t7	N	97	de0600t7	N
46	de0054t7	N	98	de0609t7	U
47	de0055t7	N	99	de0611t7	N
48	de0059t7	O	100	de0617t7	U
49	de0060t7	N	101	de0633t7	N
50	de0063t7	U	102	de0643t7	N
51	de0066t7	O	103	de0647t7	M
52	de0067t7	O	104	de0652t7	N

105	de0666t7	N	161	pa0405t7	N
106	de0695t7	U	162	pa0406t7	N
107	de0705t7	N	163	pa0409t7	U
108	de0706t7	M	164	pa0411t7	N
109	de0708t7	N	165	pa0417t7	N
110	de0724t7	N	166	pa0421t7	U
111	de0735t7	N	167	pa0429t7	U
112	de0740t7	N	168	pa0432t7	U
113	de0742t7	N	169	de0004t7	U
114	de0747t7	N	170	de0008t7	ND
115	de0764t7	N	171	de0009t7	ND
116	de0777t7	O	172	de0010t7	ND
117	de0781t7	N	173	de0011t7	ND
118	de0793t7	U	174	de0012t7	ND
119	de0794t7	N	175	de0013t7	ND
120	de0798t7	N	176	de0014t7	ND
121	de0800t7	O	177	de0016t7	ND
122	de0816t7	N	178	de0017t7	ND
123	de0818t7	N	179	de0018t7	M
124	de0835t7	N	180	de0019t7	ND
125	pa0078t7	U	181	de0023t7	O
126	pa0080t7	N	182	de0024t7	N
127	pa0088t7	U	183	de0029t7	ND
128	pa0089t7	U	184	de0030t7	ND
129	pa0095t7	U	185	de0032t7	ND
130	pa0158t7	U	186	de0033t7	O
131	pa0159t7	U	187	de0034t7	ND
132	pa0187t7	N	188	de0035t7	ND
133	pa0190t7	U	189	de0042t7	ND
134	pa0192t7	U	190	de0047t7	ND
135	pa0209t7	U	191	de0048t7	N
136	pa0215t7	N	192	de0049t7	ND
137	pa0218t7	N	193	de0051t7	O
138	pa0220t7	N	194	de0053t7	ND
139	pa0238t7	N	195	de0065t7	ND
140	pa0249t7	U	196	de0068t7	N
141	pa0256t7	N	197	de0069t7	ND
142	pa0258t7	U	198	de0071t7	N
143	pa0272t7	N	199	de0072t7	ND
144	pa0283t7	N	200	de0076t7	U
145	pa0295t7	N	201	de0077t7	ND
146	pa0309t7	U	202	de0078t7	ND
147	pa0314t7	N	203	de0080t7	ND
148	pa0317t7	N	204	de0082t7	ND
149	pa0319t7	N	205	de0086t7	ND
150	pa0323t7	N	206	de0087t7	ND
151	pa0333t7	N	207	de0088t7	ND
152	pa0336t7	N	208	de0093t7	N
153	pa0353t7	N	209	de0094t7	ND
154	pa0363t7	N	210	de0097t7	O
155	pa0364t7	N	211	de0098t7	ND
156	pa0366t7	U	212	de0100t7	ND
157	pa0382t7	N	213	de0101t7	ND
158	pa0383t7	N	214	de0102t7	ND
159	pa0388t7	N	215	de0106t7	ND
160	pa0389t7	N	216	de0109t7	U

217	de0110t7	N	273	de0214t7	ND
218	de0111t7	N	274	de0215t7	ND
219	de0113t7	ND	275	de0218t7	ND
220	de0115t7	O	276	de0221t7	ND
221	de0117t7	ND	277	de0223t7	O
222	de0118t7	U	278	de0227t7	ND
223	de0119t7	ND	279	de0229t7	O
224	de0123t7	ND	280	de0230t7	ND
225	de0125t7	ND	281	de0232t7	ND
226	de0126t7	ND	282	de0234t7	ND
227	de0129t7	ND	283	de0235t7	ND
228	de0130t7	U	284	de0237t7	ND
229	de0131t7	O	285	de0238t7	ND
230	de0132t7	ND	286	de0239t7	N
231	de0134t7	O	287	de0241t7	N
232	de0135t7	ND	288	de0242t7	O
233	de0137t7	M	289	de0244t7	N
234	de0138t7	ND	290	de0247t7	O
235	de0140t7	ND	291	de0252t7	ND
236	de0141t7	ND	292	de0255t7	N
237	de0145t7	ND	293	de0256t7	ND
238	de0146t7	O	294	de0260t7	N
239	de0148t7	ND	295	de0261t7	N
240	de0149t7	ND	296	de0263t7	N
241	de0151t7	O	297	de0264t7	ND
242	de0152t7	ND	298	de0265t7	ND
243	de0154t7	ND	299	de0266t7	O
244	de0156t7	ND	300	de0267t7	N
245	de0157t7	U	301	de0268t7	ND
246	de0158t7	ND	302	de0272t7	ND
247	de0159t7	N	303	de0273t7	ND
248	de0162t7	ND	304	de0274t7	N
249	de0169t7	U	305	de0276t7	O
250	de0170t7	O	306	de0277t7	M
251	de0174t7	ND	307	de0279t7	N
252	de0176t7	ND	308	de0280t7	ND
253	de0177t7	O	309	de0281t7	N
254	de0182t7	ND	310	de0282t7	ND
255	de0183t7	ND	311	de0284t7	ND
256	de0184t7	ND	312	de0286t7	ND
257	de0186t7	ND	313	de0339t7	ND
258	de0187t7	M	314	de0483t7	ND
259	de0189t7	ND	315	de0484t7	M
260	de0191t7	M	316	de0491t7	ND
261	de0192t7	ND	317	de0499t7	ND
262	de0193t7	ND	318	de0507t7	M
263	de0195t7	N	319	de0511t7	O
264	de0196t7	N	320	de0519t7	ND
265	de0197t7	N	321	de0520t7	N
266	de0198t7	ND	322	de0522t7	ND
267	de0203t7	ND	323	de0524t7	M
268	de0208t7	ND	324	de0530t7	ND
269	de0209t7	N	325	de0531t7	ND
270	de0210t7	N	326	de0532t7	M
271	de0211t7	ND	327	de0534t7	N
272	de0213t7	ND	328	de0542t7	ND

329	de0556t7	M	385	de0707t7	O
330	de0557t7	ND	386	de0709t7	O
331	de0559t7	U	387	de0710t7	ND
332	de0562t7	ND	388	de0712t7	N
333	de0566t7	U	389	de0715t7	ND
334	de0567t7	N	390	de0719t7	N
335	de0568t7	ND	391	de0722t7	ND
336	de0570t7	ND	392	de0723t7	ND
337	de0571t7	ND	393	de0725t7	N
338	de0574t7	ND	394	de0728t7	ND
339	de0581t7	ND	395	de0729t7	ND
340	de0583t7	U	396	de0731t7	ND
341	de0587t7	ND	397	de0732t7	ND
342	de0588t7	ND	398	de0737t7	ND
343	de0591t7	ND	399	de0739t7	M
344	de0592t7	ND	400	de0741t7	ND
345	de0597t7	U	401	de0744t7	N
346	de0598t7	ND	402	de0746t7	ND
347	de0599t7	ND	403	de0749t7	N
348	de0602t7	N	404	de0750t7	ND
349	de0605t7	ND	405	de0756t7	ND
350	de0608t7	ND	406	de0759t7	ND
351	de0610t7	ND	407	de0761t7	O
352	de0616t7	O	408	de0762t7	ND
353	de0619t7	U	409	de0766t7	ND
354	de0620t7	ND	410	de0768t7	U
355	de0622t7	ND	411	de0769t7	ND
356	de0623t7	ND	412	de0772t7	ND
357	de0624t7	O	413	de0776t7	ND
358	de0625t7	ND	414	de0779t7	ND
359	de0628t7	ND	415	de0785t7	ND
360	de0630t7	ND	416	de0786t7	ND
361	de0631t7	ND	417	de0788t7	ND
362	de0632t7	N	418	de0789t7	ND
363	de0634t7	ND	419	de0792t7	ND
364	de0639t7	ND	420	de0796t7	ND
365	de0642t7	ND	421	de0797t7	ND
366	de0649t7	ND	422	de0801t7	O
367	de0650t7	N	423	de0804t7	ND
368	de0656t7	N	424	de0805t7	ND
369	de0657t7	ND	425	de0806t7	ND
370	de0660t7	ND	426	de0807t7	N
371	de0661t7	O	427	de0811t7	O
372	de0662t7	O	428	de0812t7	ND
373	de0664t7	ND	429	de0817t7	N
374	de0665t7	ND	430	de0820t7	ND
375	de0667t7	ND	431	de0821t7	ND
376	de0669t7	ND	432	de0822t7	ND
377	de0676t7	ND	433	de0823t7	N
378	de0686t7	N	434	de0824t7	N
379	de0687t7	ND	435	de0825t7	ND
380	de0689t7	N	436	de0826t7	ND
381	de0691t7	M	437	de0827t7	ND
382	de0693t7	ND	438	de0829t7	ND
383	de0703t7	ND	439	de0830t7	ND
384	de0704t7	M	440	de0837t7	N

441	de0840t7	ND	497	pa0240t7	ND
442	de0848t7	ND	498	pa0252t7	ND
443	pa0079t7	N	499	pa0260t7	U
444	pa0081t7	ND	500	pa0261t7	N
445	pa0082t7	ND	501	pa0262t7	ND
446	pa0083t7	ND	502	pa0264t7	N
447	pa0084t7	ND	503	pa0265t7	N
448	pa0085t7	ND	504	pa0268t7	ND
449	pa0086t7	M	505	pa0276t7	ND
450	pa0090t7	N	506	pa0279t7	ND
451	pa0091t7	ND	507	pa0280t7	ND
452	pa0092t7	N	508	pa0282t7	ND
453	pa0096t7	ND	509	pa0285t7	ND
454	pa0100t7	ND	510	pa0299t7	ND
455	pa0101t7	U	511	pa0300t7	U
456	pa0103t7	ND	512	pa0301t7	ND
457	pa0104t7	ND	513	pa0302t7	ND
458	pa0114t7	ND	514	pa0305t7	N
459	pa0115t7	ND	515	pa0306t7	ND
460	pa0118t7	ND	516	pa0307t7	ND
461	pa0120t7	ND	517	pa0311t7	ND
462	pa0129t7	ND	518	pa0316t7	ND
463	pa0131t7	U	519	pa0318t7	ND
464	pa0133t7	ND	520	pa0321t7	M
465	pa0135t7	N	521	pa0325t7	N
466	pa0140t7	O	522	pa0326t7	ND
467	pa0142t7	ND	523	pa0332t7	ND
468	pa0143t7	ND	524	pa0339t7	ND
469	pa0146t7	ND	525	pa0346t7	O
470	pa0147t7	ND	526	pa0349t7	ND
471	pa0148t7	ND	527	pa0351t7	U
472	pa0151t7	ND	528	pa0355t7	ND
473	pa0157t7	ND	529	pa0358t7	ND
474	pa0164t7	ND	530	pa0360t7	N
475	pa0167t7	N	531	pa0362t7	ND
476	pa0171t7	U	532	pa0368t7	U
477	pa0174t7	ND	533	pa0369t7	ND
478	pa0175t7	ND	534	pa0373t7	ND
479	pa0179t7	N	535	pa0380t7	ND
480	pa0182t7	ND	536	pa0393t7	ND
481	pa0184t7	ND	537	pa0395t7	ND
482	pa0186t7	U	538	pa0396t7	ND
483	pa0189t7	ND	539	pa0397t7	ND
484	pa0207t7	ND	540	pa0410t7	N
485	pa0210t7	ND	541	pa0415t7	ND
486	pa0212t7	ND	542	pa0416t7	ND
487	pa0214t7	ND	543	pa0424t7	ND
488	pa0216t7	ND	544	pa0430t7	ND
489	pa0217t7	M			
490	pa0219t7	N			
491	pa0223t7	ND			
492	pa0224t7	ND			
493	pa0228t7	ND			
494	pa0229t7	U			
495	pa0231t7	ND			
496	pa0232t7	ND			

* In the provisional application (60/098,639) filed August 31, 1998, clone PA0293t7 was labeled clone PA0023t7 in error. That mistake has been corrected here to reflect the accurate clone name.

Table 2

SEQ ID NO	Clone name	"Novel" Region 1		"Novel" Region 2		GenBank Identifier for top 5 matching EST sequences
		Start / Stop		Start / Stop		
36.00	de000117	439-607				g835668 g857149 g1321047 g1968601 g1476832
40.00	de004017	1-201				g2166831 g4136486 g1747976 g1180529 g2265195
41.00	de004317	467-615				g5129477 g1801229 g1845053 g1544683 g1694347
43.00	de004517	1-228				g2322205 g1139955 g4267203 g2165927 g3039227
45.00	de005217	455-628				g1523492 g1548890 g1523465 g1809433 g5132985
50.00	de006317	1-114		452-624		g2197338 g5754794 g2694448 g2070840 g3419233
51.00	de006617	301-631				g2162184 g749398 g1239250 g839454 g1966148
52.00	de006717	391-623				g1521548 g848102 g1349419 g1196287 g771178
54.00	de008517	415-565				g1367045 g1367136 g2337716 g841637 g795336
63.00	de012417	411-605				g1809451 g1757444 g3181138 g2905518 g1157799
64.00	de013917	424-612				g3899105 g3431615 g3246439 g1312989 g1182375
65.00	de014317	479-598				g1239204 g1067288 g1080541 g4876470 g1188553
68.00	de017117	443-611				g867521 g1636718 g2162333 g2342197 g1466482
69.00	de017817	485-603				g1371240 g2055704 g2208007 g1686872 g1740908
71.00	de018117	1-153				g1188057 g1018287 g1447796 g1025264 g1069169
73.00	de020017	1-218		384-581		g1972267 g1989383 g964966 g2883986 g483738
74.00	de020217	448-599				g2115372 g1959491 g1329334 g1198642 g1957432
75.00	de020517	1 to 75				g779809 g2167738 g2537620 g2656428
77.00	de021217	1-185				g4265939 g1548503 g1687914 g1716864 g877386
80.00	de022817	411-594				g3446139 g3745043 g1126367 g2163321 g1195781
82.00	de024317	253-604				g2001999 g1071313 g966668 g26974
83.00	de025317	1-133				g2111781 g1663818 g574791 g1406232 g1663812
85.00	de025917	241-602				g2216159 g5177204 g1969363 g1388290 g1389464
86.00	de026217	351-583				g1025700 g2019225 g2080424 g1547366 g728148
88.00	de027517	455-592				g5665082 g5553136 g5552975 g389141 g1665092
89.00	de028717	364-630				g2026446 g4622337 g2021046 g2056125 g5037418
92.00	de049017	1-264		482-653		g1812285 g2816130 g2818085 g2819140 g1194260
96.00	de059617	362-655				g1155862 g1991972 g1996949 g1149020 g3307331
97.00	de060017	1 to 71				g883470 g1880085 g3162627 g3162628 g918039
98.00	de060917	434-582				g5037002 g1404408 g2816378 g759987 g2969638
102.00	de064317	433-605				g1382697 g5236495 g5235876 g5177792 g4453929

105.00	de066617	385-586	g2932996	g1010052	g2616680	g3277252	g2252166
106.00	de069517	401-644	g4897106	g1741190	g1501550	g3932286	g781364
107.00	de070517	431-599	g5176918	g1551249	g4739742	g2540062	g2583382
108.00	de070617	407-620	g826820	g870098	g1685556	g1687983	g685342
110.00	de072417	127-192	g2036407	g1969842	g616903	g1218717	g1745366
113.00	de074217	1 to 49	g2596046	g3277962	g4665052	g895453	g1521473
116.00	de077717	270-610	g2358992	g1692100	g1979572	g1720777	g1547963
117.00	de078117	457-608	g1982258	g1379170	g1496197	g1981084	g1982434
118.00	de079317	435-577	g1860678	g1991856	g946392	g4703537	g5741112
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159.00	pa038817	492-739	g1636721	g2006249	g5035641	g3430502	g778670
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161.00	pa040517	119-214	g4824527	g4852801	g1368093	g1392201	g1350038
164.00	pa041117	289-345	g4810371	g2369264	g3163382	g3839554	g1950020
166.00	pa042117	233-745	g5747013	g4150749	g1482715	g1137706	g3900569

423-603

384-585

TABLE 3

The following list of clones indicates those found in either the DE or PA libraries and the SW480 library

SEQ ID NO	clone name
185	de0032t7
186	de0033t7
193	de0051t7
196	de0068t7
240	de0149t7
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247	de0159t7
72	de0199t7
279	de0229t7
281	de0232t7
283	de0235t7
306	de0277t7
310	de0282t7
318	de0507t7
328	de0542t7
331	de0559t7
342	de0588t7
359	de0628t7
375	de0667t7
379	de0687t7
407	de0761t7
410	de0768t7
427	de0811t7
466	pa0140t7
470	pa0147t7
481	pa0184t7
493	pa0228t7
494	pa0229t7
140	pa0249t7
506	pa0279t7
510	pa0299t7
515	pa0306t7
517	pa0311t7
518	pa0316t7
536	pa0393t7
539	pa0397t7
544	pa0430t7

We claim:

1. An isolated nucleic acid comprising a nucleotide sequence which hybridizes under stringent conditions to a sequence of SEQ ID Nos. 1-35 or a sequence complementary thereto.
- 5 2. An isolated nucleic acid comprising a nucleotide sequence at least 80% identical to a sequence corresponding to at least about 15 consecutive nucleotides of one of SEQ ID Nos. 1-35 or a sequence complementary thereto.
- 10 3. An isolated nucleic acid comprising a nucleotide sequence of SEQ ID Nos. 1-35 or a sequence complementary thereto.
4. A nucleic acid according to claim 1, further comprising a transcriptional regulatory sequence operably linked to said nucleotide sequence so as to
15 render said nucleotide sequence suitable for use as an expression vector.
5. An expression vector, capable of replicating in at least one of a prokaryotic cell and eukaryotic cell, comprising the nucleic acid of claim 4.
- 20 6. A host cell transfected with the expression vector of claim 5.
7. A transgenic animal having a transgene of the nucleic acid of claim 1 incorporated in cells thereof, which transgene modifies the level of expression of the nucleic acid, the stability of an mRNA transcript of the nucleic acid, or
25 the activity of the encoded product of the nucleic acid.
8. A substantially pure nucleic acid which hybridizes under stringent conditions to a nucleic acid probe corresponding to at least 12 consecutive nucleotides of one of SEQ ID Nos. 1-168 or a sequence complementary thereto.
- 30 9. A polypeptide including an amino acid sequence encoded by a nucleic acid of claim 1 or a fragment comprising at least 25 amino acids thereof.

10. A probe/primer comprising a substantially purified oligonucleotide, said oligonucleotide containing a region of nucleotide sequence which hybridizes under stringent conditions to at least 12 consecutive nucleotides of sense or antisense sequence selected from SEQ ID Nos. 1-168.
- 5 11. An array including at least 10 different probes of claim 10 attached to a solid support.
12. The probe/primer of claim 10, further comprising a label group attached thereto and able to be detected.
- 10 13. The probe/primer of claim 12, wherein said label group being selected from radioisotopes, fluorescent compounds, enzymes, and enzyme co-factors.
- 15 14. An antibody immunoreactive with a polypeptide of claim 9.
15. An antisense oligonucleotide analog which hybridizes under stringent conditions to at least 12 consecutive nucleotides of one of SEQ ID Nos. 1-35 or a sequence complementary thereto, and which is resistant to cleavage by a nuclease.
- 20 16. A test kit for determining the phenotype of transformed cells, comprising the probe/primer of claim 12, for measuring a level of a nucleic acid which hybridizes under stringent conditions to a nucleic acid of SEQ ID Nos. 1-544 in a sample of cells isolated from a patient.
- 25 17. A test kit for determining the phenotype of transformed cells, comprising an antibody specific for a protein encoded by a nucleic acid which hybridizes under stringent conditions to any one of SEQ Nos. 1-544.
- 30 18. A method of determining the phenotype of a cell, comprising detecting the differential expression, relative to a normal cell, of at least one nucleic acid

which hybridizes under stringent conditions to one of SEQ ID Nos. 1-544, wherein the nucleic acid is differentially expressed by at least a factor of two.

19. A method for determining the phenotype of cells in a sample of cells from a patient, comprising:
- i. providing a nucleic acid probe comprising a nucleotide sequence having at least 12 consecutive nucleotides of any of SEQ ID Nos. 1-544;
 - ii. obtaining a sample of cells from a patient;
 - iii. providing a second sample of cells substantially all of which are non-cancerous;
 - iv. contacting the nucleic acid probe under stringent conditions with mRNA of each of said first and second cell samples; and
 - v. comparing (a) the amount of hybridization of the probe with mRNA of the first cell sample, with (b) the amount of hybridization of the probe with mRNA of the second cell sample, wherein a difference of at least a factor of two in the amount of hybridization with the mRNA of the first cell sample as compared to the amount of hybridization with the mRNA of the second cell sample is indicative of the phenotype of cells in the first cell sample.
20. A method of determining the phenotype of a cell, comprising detecting the differential expression, relative to a normal cell, of at least one protein encoded by a nucleic acid which hybridizes under stringent conditions to one of SEQ ID Nos. 1-544, wherein the protein is differentially expressed by at least a factor of two.
21. The method of claim 20, wherein the level of said protein is detected in an immunoassay.
22. A method for determining the presence or absence of a nucleic acid which hybridizes under stringent conditions to one of SEQ ID Nos. 1-168 in a cell, comprising contacting the cell with a probe of claim 10.

23. A method for determining the presence of absence of a polypeptide encoded by a nucleic acid which hybridizes under stringent conditions to one of SEQ ID Nos. 1-35 in a cell, comprising contacting the cell with an antibody of claim 14.
24. A method for detecting a mutation in a test nucleic acid which hybridizes under stringent conditions to a nucleic acid of SEQ ID Nos. 1-544 or a sequence complementary thereto, comprising
- i. collecting a sample of cells from a patient,
 - ii. isolating nucleic acid from the cells of the sample,
 - iii. contacting the nucleic acid sample with one or more primers which specifically hybridize to a nucleic acid sequence of SEQ ID Nos. 1-544 under conditions such that hybridization and amplification of the nucleic acid occurs, and
 - iv. comparing the presence, absence, or size of an amplification product to the amplification product of a normal cell.
25. A method for identifying an agent which alters the level of expression in a cell of a nucleic acid which hybridizes under stringent conditions to one of SEQ ID Nos. 1-544 or a sequence complementary thereto, comprising
- i. providing a cell;
 - ii. treating the cell with a test agent;
 - iii. determining the level of expression in the cell of a nucleic acid which hybridizes under stringent conditions to one of SEQ ID Nos. 1-544 or a sequence complementary thereto; and
 - iv. comparing the level of expression of the nucleic acid in the treated cell with the level of expression of the nucleic acid in an untreated cell, wherein a change in the level of expression of the nucleic acid in the treated cell relative to the level of expression of the nucleic acid in the untreated cell is indicative of an agent which alters the level of expression of the nucleic acid in a cell.

26. A pharmaceutical composition comprising an agent identified by the method of claim 25.
27. A pharmaceutical composition comprising a nucleic acid which includes a nucleotide sequence which hybridizes under stringent conditions to one of SEQ ID Nos. 1-544 or a sequence complementary thereto.
28. A pharmaceutical composition comprising a polypeptide encoded by a nucleic acid which includes a nucleotide sequence that hybridizes under stringent conditions to one of SEQ ID Nos. 1-544 or a sequence complementary thereto.
29. An isolated nucleic acid comprising a portion of a nucleotide sequence of SEQ ID Nos. 36-168 or a sequence complementary thereto.
30. A gene which hybridizes to one of SEQ ID Nos. 1-35.
31. A method for detecting cancer in which one or more of SEQ ID Nos. 1-544 are used as probes, said method comprising:
- i. collecting a sample of cells from a patient,
 - ii. isolating nucleic acid from the cells of the sample,
 - iii. contacting the nucleic acid sample with one or more primers which specifically hybridize to a nucleic acid sequence of SEQ ID Nos. 1-544 under conditions such that hybridization and amplification of the nucleic acid occurs, and
 - iv. comparing the presence, absence, or size of an amplification product to the amplification product of a normal cell.
32. A method of claim 31 in which said cancer is colon cancer.
33. A method for detecting cancer in a patient sample in which an antibody to a protein encoded by SEQ ID Nos. 1-544 is used to react with proteins in said sample.

34. A method of claim 33 in which said cancer is colon cancer.

Differential Expression Analysis

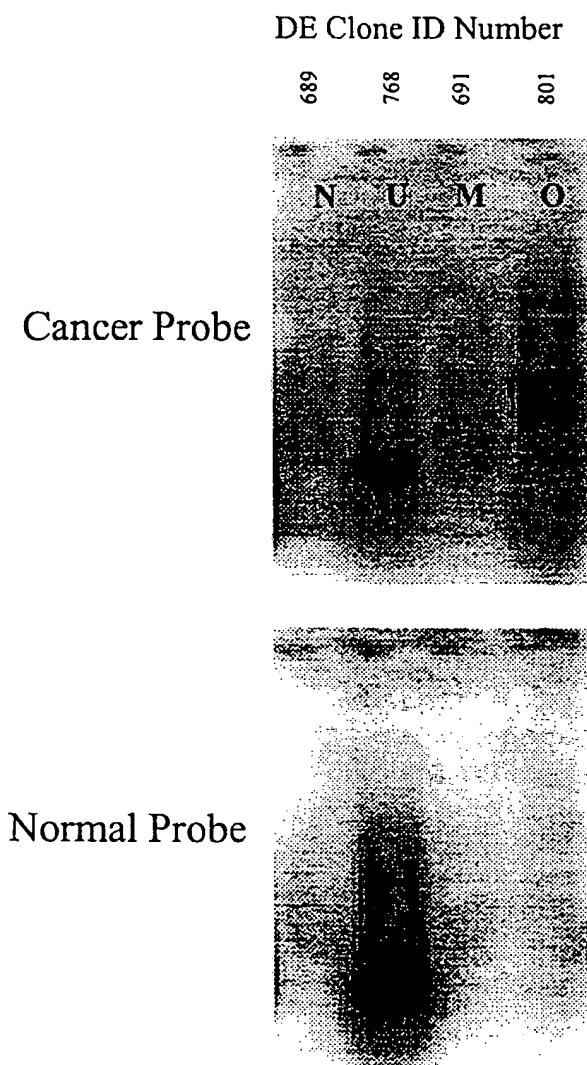


Fig. 1

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aagaacagac atttttcaaa agaagatata caaatgacta acaggtatat taaaaatgca      300
caacatcact aatcatcaga gaaatgcaaa ttaaaaccac aatgagatat catcttacc      360

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ggagtgcagt ggcgccatct tggctcacta caagctccgc ctcccgggtt cacaccattc      120
tctgtcttta gcctcccagc gcccgccacc gcacccggct aattttttgt attttttagta      180
gagacagggg ttcaccatgt tagccaggat ggtctcgatc tctgacctc gtggcccacc      240
tgccttggcc tccaaaagtg ctggaattac agtcgtgagc caccacgccc ggcctaaacc      300
atttctcttg acaacactct ggattttatt tctggccaga taccatttat caattttacc      360
atcaagaata agataatcaa aataataatc aagttttata ttagacttat gaagattctt      420
gcacctttga aattacagct atctcactag ttnattctcc tctctcatat tttattacng      480
acntccagga agacaaccaa cacctttaaa agttggctga gcatttttta nggagaccct      540
taggtaanag ggnccctnggc gggaacccct taggggnaat n                          581

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```

<210> 13
<211> 607
<212> DNA
<213> Homo sapiens

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<220>
<221> misc_feature
<222> (1)...(607)
<223> n = A,T,C or G

```

```

<400> 13
ggtactggaa caactataag acccctgttc agattaagga atttggtgca gtttcaaaag      60
tagacttttc tcctcagcct ccatataatt atgctgtcac agcttcctca agaattcaca      120
tttatggccg atactcccaa gaacctataa aaaccttttc tcgatttaaa gacacagcat      180
actgtgctac ttttcgacaa gatggtagat tgcttgtggc tggcagtga gatggtggag      240
ttcaactttt tgatataagt gggagggctc ccctcaggca gtttgaaggc catacaaaag      300
cagttcatat agtagatttt acagctgaca aatatcacgt ggtctctggg gctgatgatt      360
atacagttaa attatgggat attccaaact ccaaagaaat ttttgacatt taaaggaaca      420
ctctgattat gtgangtggt gatgtgctag caaactttta tccgatctc tttataacca      480
gggacatatg atcactactg gaagatgttg gatgcncgaa ccnattgaaa agtgggtctt      540
ccgttgagca tggccnncag tngaaantgn cctacttttc cccttgggaag gctttggggg      600
annangg                                           607

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```

<210> 14
<211> 599
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc_feature
<222> (1)...(599)
<223> n = A,T,C or G

```

```

<400> 14
ggtactttca aaatataaca attttcgttc tcccatataa caggggggcta acaagaaaac      60
caaaaataaa taaaaagaga aaatttataa ataagtataa aataaaaaaa tattttttaa      120
aagcagcctg ggcaagagaa gtgggtgggt ttaggagaat ccctttcgaa aaattcagag      180
cattattatt aatcgttctt aaattaaatg cagggccaaag catgctgcac gtggaatctg      240
gacaattttt tgataaactt taaggctgct aaataattta cagaaaactgt gaatgcattt      300
tcattttacg aggcaaaaga gaaaatattc aagattgcat agcaatttta ttttttgaaa      360

```


tggttatcct	aaagaatttc	cttaaattca	gattttgcaa	aattcctact	ctncaagtca	420
tcaagtgaac	actaaaagca	actttctcgt	gaatcagtg	actttttacga	ggcatgcatt	480
tttcataaat	ctaggccaag	tgacctaatt	gngattaaat	cttaatcatc	ctgngattct	540
ggctattaan	atgggtttta	ancngtaaaa	atnctttnaa	aaagccgtta	cttnccgan	599

<210> 15
 <211> 457
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(457)
 <223> n = A,T,C or G

<400> 15						
ggtacttttt	tttttttttt	tttttttttc	gaaatgaaca	aatatatttatt	tatctttttat	60
aacaagtaag	gcaatgttgc	ttaaaggaag	acaaacaaac	ataaaagatt	ccgttgacaa	120
tgcatttttt	catntgttcg	gcacaatgct	tttgtcataa	tggagatgtg	acagcaaact	180
ttccaggaca	ttcagtcctc	ggnnggcagca	cttagggcan	atgactggcc	gctcaaattc	240
tctatnttgt	ttcaggacag	tggaaaagct	tatanatgag	gccaaagcac	caggtaggtg	300
gaaggttctt	gtatcggttc	gaaccccgac	agcgcgcaa	cagacaacac	naggcagtg	360
ggagcaacat	gctgttttaa	tgancgcctg	ggtgcangcg	tgctgaggct	gaaaatggca	420
taacccccgc	gtcctgccng	gcgggcgttc	aaanggn			457

<210> 16
 <211> 643
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(643)
 <223> n = A,T,C or G

<400> 16						
ggtacaatct	agctgaaatc	atatacaagt	aagtaggtgt	ggactttttac	tgctgagcta	60
aagtttatgt	ttatatatgt	tttattcttt	aagctaaaca	aacattcaga	taacattcta	120
tgcatttttt	gaagcatagg	gttagtaatg	aggacttaga	ttttttaatt	aaacaattca	180
gtaactatat	aaaaagaaaa	ggagtccctt	atgaataaat	attaaaatta	aaagaaatag	240
gcaactataa	aagtaagtat	ttttaataat	ggcattgatt	ttagtaagaa	atcaattagg	300
ctgggctgga	aagaaaaaact	ggcttaatat	aaagtagttt	taatatggca	aatattcttc	360
ttaaaattgn	ggccctggaa	tatcatttct	gcctattgct	gatgctaagg	natcaactgn	420
gccaaagtatt	gggctgntcc	acagggtgga	angagtagca	acattttgng	gatttttttt	480
tttttttaaa	accggagaat	acccggccag	gggntcaagn	ctgnatccac	antttgggag	540
nttagccgga	naanccttgg	anccggagna	aaggttnaan	gagncaaaat	gngccatggn	600
ttccanctgg	ggacccgggg	gnaactcttt	taaaccnaaa	aat		643

<210> 17
 <211> 336
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1) ... (336)
 <223> n = A,T,C or G

<400> 17
 ggtactttga taaatgtaga aagattatnt aattctggct tggtagcgtg gctcatgcct 60
 ataatcccag cacttcagga ggctgagggt ggtggatcac ttgagctcag gagtttgaga 120
 ccaggcgaaa ccctgtctcc acaaaaaatg caaaaattgc tggacatggt ggacacatgcc 180
 tgtagtccca gctacttgga aggtctgaggc aggaggatag cttgagccca ggaggtcaag 240
 gttgcagtga gccgagattg tgccactgca ctccagcctg ggcaacagag caagaccctg 300
 cctcaaattt aaaaaaaaaa aannaaaaaa aaaagt 336

<210> 18
 <211> 614
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1) ... (614)
 <223> n = A,T,C or G

<400> 18
 ggtacactct tcttcgcctt tgagtgcgcg tacctggctg ttcagctgtc tcctgccatc 60
 cctgtatttg ctgccatgct ctcccttttc tccatggcta cactgttgag gaccagtttc 120
 agtgaccctg gagtgattcc tcggggcgcta ccagatgaag cagctttcat agaaatggag 180
 atagaagcta ccaatggtgc ggtgccccag ggccagcgac caccgcctcg tatcaagaat 240
 ttccagataa acaaccagat tgtgaaactg aaatactgtt acacatgcaa gatcttcagg 300
 cctcccgggc ctccattgca gcatctgtga caactgtgtg gagcgcttcg accatcactg 360
 cccctgggta gggaaatgtg ttggaaaaga ggaactaccg ntacttctac ctcttcaccc 420
 tttctctttt cctcccttac aaactaaggc cttngctttc aacatcgcta tgtgggacct 480
 aaaatctttg aaaattggct ttttggaana cattgaaaga aactcctgga aactggctta 540
 gaaagnctta attgcttctt tacactttgg nccnnncggg actgatggga tttcanactt 600
 tcttgggact ttta 614

<210> 19
 <211> 296
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1) ... (296)
 <223> n = A,T,C or G

<400> 19
 actttttttt tttttttttt ttttttttgg gatggagtct cactntgttg ccaaggctgg 60
 agtgacgtgg cataatttcg gctcacttca acctctgect cccgggttca agcaattctg 120
 cgtcagcctc cggaggagct aggactacag gcatgcacca ccatgcccac ctaatttttg 180
 nattttttagt agagatggag tttcaccata ttgaccaggc taggctgggtc ttgaactcct 240
 agcctnaggt gatctgcccc cctnagcccc ccaaagtacc tcggccgtga ccacgc 296

<210> 20
 <211> 565
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(565)
 <223> n = A,T,C or G

<400> 20
 accaattata atgcattatt atgaaatatt taaaatgggg aatccaagat gacatagttt 60
 ttaactcatc cacatactgg aagtttagag aaactcagaa tttcttattt ctttttcttt 120
 ttctccata gcataaaagc tttgctaata agaataaata tataatattg agtttttagtg 180
 tttgatcctg tgatcagttg taaccatgtg tcataaaaact ctctcacaga ttccatcttt 240
 cccaaatctt ctgatcataa cacagattgc catatagact tcccttgtaa ggagaatatg 300
 ctggccataa ggcaagcana agtgaacttg cagtttcact tcttggaat taatgcattt 360
 gcattgactt ctataannta atctctcctg aatttttttg cttagtcaac ttactgtgtg 420
 caaagncaac agnaaattgt ctttggttna acttttaaca ggncaattta taaattgggt 480
 tgaagaagcn tcccnaaatt ttttattgaa ggctgaattc aagcctcctt taaaatggnc 540
 atngnataan gggaatttat tgtng 565

<210> 21
 <211> 582
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(582)
 <223> n = A,T,C or G

<400> 21
 ggtactggaa caactataag acccctgttc agattaagga atttggcgca gtttcaaaag 60
 tagacttttc tcctcagcct ccatataatt atgctgtcac agcttcctca agaattcaca 120
 tttatggcgc atactcccaa gaacctataa aaaccttttc tcgatttaaa gacacagcat 180
 actgtgctac ttttcgacaa gatggtagat tgcttggtggc tggcagtga gatggtggag 240
 ttcaactttt tgatataagt gggaggggctc ccctcaggca gtttgaaggc catcaaaagc 300
 agttcataca gtagatttta cagctgacaa atatcacgtg gtctctgggg ctgatgatta 360
 tacnagttaa atttatgggg atattncaa cttccaaaga aaattttgnc catttaaaag 420
 aacactctng antatggnga aggtgnggnt tgtgcctaac caaactta tccgggatct 480
 tttttatnta ccnggattcn tttggatctt ncnggtaaaa aanggttga tnccccnaac 540
 nnattgaaaa nngttctntc cnnttgacct nggccancn ng 582

<210> 22
 <211> 349
 <212> DNA
 <213> Homo sapiens

<400> 22
 actttttttt tttttttttt ttttttgaga tggagtcttg ctcttggtgc ccaggctgga 60
 gcaacctccg cctcctgggt tcaagtgatt ctctgcctc aacctcccga gtagctggga 120
 ttacagggtgc ccgccaccat gccgagctaa tttttgtatc cctagttaa acggagtttt 180

gccatgttgg	ccaggctggt	ctcgaactcc	taacttcatg	atctgctcac	catggcctcc	240
caaagtgcg	ggattacagg	cgtgagccac	tgtgcccac	cctcttttcc	tttttcaaat	300
gtcaatggaa	agttgattgg	aaaggacaat	ttggctacct	tttgggtacc		349

<210> 23

<211> 576

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1) ... (576)

<223> n = A,T,C or G

<400> 23

acctgttctt	ggagccaatg	tgactgcttt	cattgaatca	cagaatggac	atacagaagt	60
tttggaactt	ttggataatg	gtgcaggcgc	tgattctttc	aagaatgatg	gagtctactc	120
caggatattt	acagcatata	cagaaaatgg	cagatatagc	ttaaaagtgc	gggctcatgg	180
aggagcaaac	actgccaggc	taaaattacg	gcctccactg	aatagagccg	cgtacatacc	240
aggctgggta	gtgaacgggg	aaattgaagc	aaacccgcc	agacctgaaa	ttgatgagga	300
tactcagacc	accttggagg	atttcagccg	aacagcatcc	ggaggtgcat	ttgtgggtatc	360
acaagtccca	agccttcctt	gcctgaccaa	taccaccaa	gtcaaatac	agaccttgat	420
gccacagttc	attaggataa	gattattctt	acatggacag	caccaggaga	taattttgat	480
gttggaag	ttcaacgtta	tatcataaga	ataatgccag	tattcttgac	taagagacag	540
ttttgatgat	ctcttaagta	aatactctga	ntgccc			576

<210> 24

<211> 618

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1) ... (618)

<223> n = A,T,C or G

<400> 24

acttaaaata	aagttaacaa	ttacaacaga	cccaatcaca	gacaatacca	gcgtagaaat	60
attaactcca	gaattatgac	ttttatcagg	agtaggagta	ggagtaggag	taggtgtagg	120
atcaatgtca	tcaggatttg	cttgagggat	aaacaaagtt	acttgtgcaa	tgttggatac	180
ttttgatgtc	aaattgcttt	tatctatact	tttaatggca	ataaatatgt	gggttgcat	240
ttcttctgag	atattttctg	gtttaaatgc	aaagctttcc	ttggagttgg	cctcctttgg	300
tgacagatca	gtagtattta	cttgaagagc	atcatcaaaa	ctgtctctta	gatcaagaat	360
acttgcactt	attcttatga	tataacgttg	aacttttcca	acatcaaaat	tatctcctgg	420
tgctgtccat	gtaagaataa	tcttatcctc	atgaactgtg	gcatcaagg	ctgtgatttg	480
acttggtggg	tattggtcag	caagggaagg	cttgggactt	gtgatccaca	aatgccctcc	540
ggatgctgtc	ggctgaaatc	ctccangtgg	ctgagtatcc	tcataaattc	aggtcttggc	600
nggttgcttc	aatttccc					618

<210> 25

<211> 595

<212> DNA

<213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(595)
 <223> n = A,T,C or G

<400> 25
 acataccacg ctgggtagtg aacggggaaa ttgaagcaaa cccgccaaga cctgaaattg 60
 atgaggatac tcagaccacc ttggaggatt tcagccgaac agcatccgga ggtgcatttg 120
 tggntncaca agtcccaagc cttcccttgc ctgaccaata cccaccaagt caaatcacag 180
 accttgatgc cacagntcat gaggataana ttattcttac atggacagca ccaggagata 240
 attttgatgt tggaaaagtt caacgntata tcataagaat aagtgcaagt attcttgatc 300
 taagagacag ttntgatgat gctcttcaag taaatactac tgatctgtca ccaaaggagg 360
 ccaactccaa ngaaagcttt gcntttaaac cagaaaatat ctcagaagaa aatgcaaccc 420
 acatatttat tgcctttnaa agtatagata nagcaatttg acatcnaagt ntccacattg 480
 nacaagtnac tttggttata cctcagcaaa tctgatgaca ttggatctac tctactctac 540
 ttctantctt gaaaaaggat aatccgngnt aaattttccc tggattgctg ggatg 595

<210> 26
 <211> 361
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(361)
 <223> n = A,T,C or G

<400> 26
 actttttttt tttttttttt ttttttctga gcatattata tctaattttt gaagggtgta 60
 ttttctccct tgttttaatt ttctgcanat acttttttct tttttacttt cccaattag 120
 tttgtttctg actttcttcc tcaatctctc ctgaaccatt gtttnttttt aagatcagag 180
 cagattctta ggaactttta aaactgtatg tgggtgggat tgtcacctan agtgcttttt 240
 tggagagtaa ttggatggng tgataattaa ttttatgtgt caatttgaca gggctctggg 300
 gtgtccagtt atttggttaa acattatttc tgggtgtgcc taaaagggtg tccgcgctac 360
 c 361

<210> 27
 <211> 611
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(611)
 <223> n = A,T,C or G

<400> 27
 acctgttctt ggagccaatg tgactgcttt cattgaatca cagaatggga catacagaag 60
 ttttggaact tttggataat ggtgcaggcg ctgattcttt caagaatgat ggagtctact 120
 ccaggatatt tacagcatat acagaaaatg gcagatatag cttaaaagtt cgggctcatg 180
 gaggagcaaa cactgccagg ctaaaattac ggctccact gaatagagcc gcgtacatac 240
 caagctgggt agtgaacggg gaaattgaag caaacccgcc aagacctgaa attgatgagg 300

atactcagac	caccttggag	gatttcagcc	gaacagcatc	ccgaggtgca	tttgtggtat	360
cacaaagtcc	caaacctttc	cttgccctgac	caatacccac	caagtcaaat	cacagacctt	420
gatgccacaa	gtcatttaga	taaaatattc	ttacatggan	gcccangaaa	taattttgat	480
gttngnaaag	ntcacctgnt	ntataanaat	aaggccagtt	ttttgactaa	aaaaagtttg	540
aagagctttc	aagaaancta	tgatttgncc	caagggggccc	tccaggaagn	ttgtttttacc	600
caaaattttt	a					611

<210> 28

<211> 443

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(443)

<223> n = A,T,C or G

<400> 28

cgtgcccaaa	gcttggcaag	ttttcggtt	taaccacgca	caccaccacc	accaccatnc	60
taaataactt	actgcatect	caaagcctgt	tttatgggga	ttgcatgggt	ttatttgaaa	120
tcacgcctgt	aatcccanca	ctttgggagg	ccaaggcagg	cagatcacaa	ggtcaggaga	180
tcgagaccaa	tctggctaca	cggtgaaacc	ctgtctctat	taaaaaaaaat	acaaaacaat	240
tagccaggca	tgggtggcagg	cgctgtagt	cccantact	cgggaggctg	angcaagana	300
atggcgtaga	acttggaggc	ggagcttgca	atgagccgag	atcgcacttg	ctgcacttna	360
acctgggcaa	caaacgaga	cttcatntct	nttttnnaaa	nnnaannnnn	nnnnnnnnng	420
tcctttggcc	cgaccacnct	tan				443

<210> 29

<211> 403

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(403)

<223> n = A,T,C or G

<400> 29

ggtacttttt	tttttttttt	tttttttttg	gagtgcata	catcacccca	actteggttt	60
tttacatttt	aatttgtatt	gnttttaatt	tattttgagg	caatgtctca	ctatgttgcc	120
caggctgggtc	tcaaatgaaa	acaatgctat	caatcacatt	cttgcatagg	atatgtgtca	180
gtaatcctcc	aaaatgaaca	tganaaatgg	aattgtcaag	tcatagatta	agtgcata	240
acttttgaat	agatagtata	aattttttcc	ccaaatgaga	attttatatt	ctcactggca	300
acatgaaaat	agccatctct	ctataatctt	atcaaccctc	gatagtgtca	ttttttaatt	360
tataattatg	agtgaaaatg	gtcctgcccn	ggcgggcgct	cga		403

<210> 30

<211> 615

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(615)

<223> n = A,T,C or G

<400> 30

ggtacagtgg	tagcatccaa	atgggcaaac	gtagtagcag	gggcaggggc	agtcaagtca	60
tcagcaggca	catagatagc	ctgtactttg	taatatctt	cccacccttg	agaatggact	120
ttgtaagatc	cgccccctgc	ccacaaaaaa	atttctccta	actccactgc	ctatcccaaa	180
cctataagaa	ctaatagataa	tcccaccacc	ctttgctgac	tctcttttca	aactcagcct	240
gcctgcgccc	aggtgattaa	aaagctttat	tgctcaccca	aagcctgttt	ggtgggtctct	300
tcacacagac	gcgcgtgaca	gaaaccactt	gaagcccggg	cgcggtggct	caggcctgta	360
atcccagcac	tttgggaggc	tgaggtgggt	ggattacctg	aggtcangag	ttcgagacca	420
gcctgacca	catggtaaaa	ccctgtctct	actaaaaatc	aaaaaaanta	accnnggggtg	480
gtggnnggca	cctgtaattc	agttcttggg	accttangca	ngaaaaatcct	tgaacttgga	540
ggcggaggtg	catanttgaa	acaaaccttg	nctcaacctg	gnaacaaaat	aaaaatccgn	600
tnaaaaaana	aaaaa					615

<210> 31

<211> 485

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(485)

<223> n = A,T,C or G

<400> 31

acgcggggat	aagctacaac	ataaacacat	ctaggttctt	gttcttagaa	tacagcatga	60
agaatttgct	ttcttctttc	ttcctaacat	tttcatgtga	gatccagaaa	ggacacattg	120
tctctggcca	ttcgaagaaa	gaaagaaaga	aagaaaaaaa	aggtatttag	agacagagag	180
agaaaaaggc	tgaaatgggt	tcgctgggtt	ctaaaaatcc	gcaaaccaaa	caagcccaag	240
ttcttctttt	gggacttgac	tcagctggga	agtctactct	cctttataaa	ttaaagcttg	300
ctaaggatat	taccaccatc	cctacaatag	gtttcaatgt	ggaaatgatc	gagttggaaa	360
ggaatctttc	actcacagtc	tgggatgttg	gaggacagga	aaaaatgaga	actgtttggg	420
gctgttctgt	gagaaccena	tnggctngtg	tatgtgtgga	cagtccttcg	gcccgaaccc	480
cttan						485

<210> 32

<211> 780

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(780)

<223> n = A,T,C or G

<400> 32

cgaggtacgc	gggtgtctag	accttatgtc	aaaataagcc	caattgtatt	aaagagtatt	60
aaattgtatt	aagaataaaa	acacatggcc	gggcacgggtg	gctcacgcct	gtaatcccag	120
cactttggga	ggacgagatg	ggcggattac	aaggtcagga	gattgagacc	atcctggcta	180
acatggtgaa	accccgctctc	tactaaaaat	acaaaaaaa	aattgtccag	ccgtgggtggc	240
aggtgcctct	agtcccacta	ctccagagct	gaggcaggag	aatgatgtga	acccgggagg	300

canagcttgn	agtgagccng	agatctcgcc	actgcactcc	ggcctaggcg	acagagcgag	360
actctgtctc	anaaaaaaat	aatgantaaa	aaaanaagtc	ctgcccggcc	ggcgntcnaa	420
nggcgaattt	cancacatgg	cngcngttac	tatggatcen	actcgggtcca	anctggcgta	480
atcatggcat	agnttttntc	gtggnaaatg	gtatccgtnc	aantcncna	attcaaccgg	540
agcttaannn	ntaacctggg	gcnatnnnnn	nctacttcat	tattgcntnc	ntatggcgct	600
tncattggaa	ctnttgcnc	gnntatnate	gccncncngg	aaagnnttnn	ntgggncctt	660
ctctgttann	atctnnggct	tngttgggag	gntnctntna	gnggntngtt	tnatnggtcc	720
ngnaaatctc	agcctangnc	antnagcctn	ttgnttaatc	tcnactnna	aaaaataang	780

<210> 33
 <211> 742
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(742)
 <223> n = A,T,C or G

<400> 33						
acataccagg	ctgggtagtg	aacggggaaa	ttgaagcaaa	cccgccaaga	cctgaaattg	60
atgaggatac	tcagaccacc	ttggaggatt	tcagccgaac	agcatccgga	ggtgcatttg	120
tggtatcaca	agtcccaagc	cttcccttgc	ctgaccaata	cccaccaagt	caaatacacag	180
accttgatgc	cacagttcat	gaggataaga	ttattcttac	atggacagca	ccaggagata	240
atcttgatgt	tggaaaagtt	caacggtata	tcataagaat	aagtgcgaag	attcttgatc	300
taagagacag	ttttgatgat	gctcttcaag	taaatctact	gatctgcacc	aaaggaggcc	360
aacttcaagg	aaagctttgc	atttaaccan	aaaatattta	taagaaaatg	caccacata	420
ttataccatt	aaaagttnga	taaaacantt	tgccctcaaaa	gtttccacca	tggaacaagta	480
acttggttat	cctnagcaat	cttgtgcctt	gattactcnn	ctctattcta	tcctgtnaaa	540
gcntaatctg	agtaaaatct	nccctggntt	gtggattggc	tngtnatgta	atttnttaag	600
nctggcngac	cncatggnaa	tnnccttggg	cgttangncc	gtngccantt	gtattngtaa	660
tttctngaag	gtnttcnnnn	nnntaccngt	aagnatgggn	tnngnnatnn	atnttttncn	720
tnntnatnnn	cntnnannnn	tg				742

<210> 34
 <211> 763
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(763)
 <223> n = A,T,C or G

<400> 34						
ggtcaaatga	ggaataatga	ggaaacaaaa	ccatacatat	aagagggatg	gcacagacct	60
tgtgacaaag	tggtcctgaa	atttctggag	gggaaatgaa	taagaataac	cgagatagtt	120
atgcttggag	gaagaggaag	atcaagggtg	cctaacctac	cagaaactaa	gacttatgaa	180
accttagtca	ttaaaaatat	tagtattagt	tcagaaatag	taaataaatc	aatgtaactg	240
aatggaacct	gggaacaaat	atagctacat	gtaagatctg	ggtatatgct	ggaggtgaca	300
taacaaatga	agagaaacaa	tggactattc	aaagctgtgt	tgctatcttt	attggcaaca	360
aatatgggaa	aaaatnaaat	gagatcctat	tcacatgaat	gacaaaaata	aatgccatat	420
tgattaaacc	taaatatgac	aaggaaggcc	tcaaatttta	gaaaaaaatg	ccaaattnta	480

cncattggga	gataattcat	taacaagacc	aanaacnta	aggaaagatg	ntaattnnga	540
tatattaaga	tttactatgt	ttataaatca	aggatagtcc	cgcttaagan	actttctttt	600
atttttaatt	aatattatta	atatttgana	cttgcttgnt	tnggtgaacc	ggtaatttgg	660
tattnacctt	ctccggttan	gattnnctaa	ncctgtgtnt	nngttgnncc	ncncnatttt	720
tntacagttt	ttgcgcgnta	ttncnggnng	ccccnnngn	ngg		763

<210> 35
 <211> 767
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)... (767)
 <223> n = A,T,C or G

<400> 35						
acaggggaat	ggaatggaat	ggaatgcaat	ggaatggaat	catccgtaat	ggaattgaaa	60
ggaatggaat	ggaatggaat	ggaatggaat	ggaatggaat	ggaatcaact	cgattgcaat	120
cgaatggaat	ggaattgaac	taacccgaat	agaatcgaat	ggaatggaat	ggaacggaac	180
ggaatggaat	ggaatggaat	ggaatggaat	ggaatggaat	ggaacggaac	ggaatggaat	240
ggaatggaat	ggaatggaat	ggaatcaacg	cgagtgcagg	ggaatggaat	ggaatggaat	300
gcaatggaat	ggaatcttcc	ggaatggaat	ggaatggaat	ggaatggaat	ggaatggaat	360
gcaatggatt	caactcgatt	gcaatggaat	ggaatanaat	ggaatggaat	ggaatggagt	420
ggaataattc	naatagaatg	gaatggaatg	gaatggaacg	gaatggaccg	gatggaacca	480
attgtaattg	aatggaattg	atggaatgga	atggaatcac	cctagtcaan	ggaatgtatg	540
gaccggattc	aatgaatgga	tattccgnat	ggatggatgg	gaatgaattg	atgattggat	600
ggatggatca	ccatccatga	agattgatga	tggatgatgc	cacccatgat	gattatgnat	660
tagngtnata	tctncatnna	ggatgntncn	attatgngnt	gatgacatga	ntannccnnc	720
ncctttnancn	tatttttttg	ggncccccctc	ccagttgntt	taaannnn		767

<210> 36
 <211> 608
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)... (608)
 <223> n = A,T,C or G

<400> 36						
acatatagtc	aacgaaatat	tcaaagaata	actttatata	ctcttgttct	ttaaattcta	60
tcctctcttt	cagaattctt	ccatttaagt	ttgggtattt	tcctagtctc	aacagatgaa	120
cagaagactt	cattgaacat	tttgacagta	agctactaga	gaccaattat	caactggtgc	180
tacacatgct	gtgttatctc	ccttactatt	aaactataac	cctctcttgc	tattttgttt	240
catgcacac	caaccaaact	tcattttttc	taataaaaaa	taaatatata	aagaagacac	300
tgacaggcat	atattcacaa	gatctcaact	tcttaaaaaca	taagtatggg	tatattttatt	360
tctctcaaat	gcatacnaga	caataattac	ncagcaacca	atcttttggt	caacaatgat	420
ttgantcata	agcatttgga	aattacataa	tttcatatca	atanccctgt	ttttttnaata	480
cagaagtaaa	aaanccccaa	taaccaatct	taaatttcna	ttatccccct	acctccaacc	540
tttnaaaggt	cccaccgggc	cttttccnac	attaatttgg	tnaaactggg	gttnaaaacc	600
gcctnccn						608

<210> 37
 <211> 245
 <212> DNA
 <213> Homo sapiens

<400> 37
 acagacatgg cggcggttt tcggaaggcg gctaagtccc ggcagcggga acacagagag 60
 cgaagccagc ctggctttcg aaaacatctg ggcttgcctg agaaaaagaa agattacaaa 120
 cttcgtgcag atgactaccg taaaaaacia gaatacctca aagctcttcg gaagaaggct 180
 cttgaaaaaa atccagatga attctactac aaaatgactc gggttaaact ccaggatgga 240
 gtacc 245

<210> 38
 <211> 630
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1) ... (630)
 <223> n = A,T,C or G

<400> 38
 actacactga attcaccccc actgaaaaag atgagtatgc ctgccgtgtg aaccatgtga 60
 ctttgtcaca gcccaagata gttaagtggg atcgagacat gtaagcagca tcatggagggt 120
 ttgaagatgc cgcatttggg ttggatgaat tccaaattct gcttgcttgc tttttaatat 180
 tgatatgctt atacacttac actttatgca caaaatgtag ggttataata atgttaacat 240
 ggacatgac ttctttataa ttctactttg agtgcgtgtc ccatgtttga tgtatctgag 300
 caggttgctc cacaggtagc tctaggaggg ctggcaactt anagggtggg agcagagaat 360
 tctcttatcc aacatcaaca tcttggtcag atttgaactc ttcaatctct ttgcactcaa 420
 agcttgtna gatagtttaa gccgtgcata aattnacttc caaatttaca tactctgctt 480
 anaaatttgg ggggaaaaat taaaaaatnt aattggccag gatnttgga atttgttata 540
 atgaatgaaa cattttngna ttaaaaatca nattacttnt aanctttgat aaantaaggc 600
 atggntgggg gtaattgggt tttttgttcc 630

<210> 39
 <211> 626
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1) ... (626)
 <223> n = A,T,C or G

<400> 39
 acagtgggtc ttttcagagt tggacttcta gactcacctg ttctcactcc ctgttttaaat 60
 tcaaccagc catgcaatgc caaataatag aattgctccc taccagctga acagggaggga 120
 gtctgtgcag tttctgacac ttgttggtga acatggctaa atacaatggg tatcgtgag 180
 actaagtgt agaaattaac aaatgtgctg cttgggttaa atggctacac tcatctgact 240
 cattctttat tctattttag ttggtttgta tcttgccata ggtgcgtagt ccaactcttg 300
 gtattaccct cctaatagtc atactagtag tcatactccc tgggtgtagt tattctctaa 360

aagcttttaa	tgtctgcatg	cagccagcca	tcaaatagtg	aatgggtctct	ctttggctgg	420
aattacaaaa	ctcaaagaaa	tgtgtcatca	ggagaacatc	ataacccatg	aaggataaaa	480
gccccaaatg	gnggtactga	taataacact	aatgcnttaa	gatttggtca	ccctctcnct	540
aagggagccc	attgagccna	ngnggctaaa	gcctcatact	ccacctgaat	ggttaggaga	600
aaatttatcc	caaaaaaaaa	aaaaan				626

<210> 40
 <211> 645
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(645)
 <223> n = A,T,C or G

<400> 40						
cgaggtagcg	gggcaggaca	tttaaaaggt	ttcagcagaa	atcttatgat	tatgtctgac	60
ttgcagtatt	ttatttgcc	ctttgacggc	tttttttttt	tttttttttg	agacagagtc	120
tcacactgca	ctccagcctg	ggtgacagag	tgagagactc	cgtctcaaaa	atgaatgaat	180
gaatgaatga	atgaatgaac	aaacgaacaa	ggtgggttaa	tgtcagaaaa	cttcctaagc	240
atttgctccc	caaacctttc	atgtttttca	agaagccttt	attacataaa	ggggaataga	300
attaaaatgt	ttctttataa	gaaaaatata	catatttggtg	ttcttgggccc	cattaaaact	360
aatcagtagt	cccttggcca	aaaaatagtc	aacaaganaa	ctgggtatga	ntccnggcnt	420
tactcctgnt	cataagtng	gatgcntgtg	tctganccna	actgnctcaa	ctngagctct	480
tgggggtataa	caanaaaccc	gngttttcat	gaaaccctcg	ggccnttata	aaaggtttcc	540
cttggggggc	ccaatgctta	ttntngattn	gggttccaaa	anntngcaat	tggnataggt	600
gcttgaaata	acccctttt	agtnnaattc	cnaccaaaac	cntgn		645

<210> 41
 <211> 616
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(616)
 <223> n = A,T,C or G

<400> 41						
acgcggggct	cttcacgagg	tggaacaag	atggaggatt	cggcctcggc	ctcgtctgtct	60
tctgcagccg	ctactggaac	ctccacctcg	actccagcgg	ccccgacagc	acggaagcag	120
ctggataaag	aacagggttag	aaaggcagtg	gacgctctct	tgacgcattg	caagtccagg	180
aaaaacaatt	atgggttgct	tttgaatgag	aatgaaagtt	tatttttaat	ggtgggtatta	240
tggaaaattc	caagtaaaga	actgaggggtc	agattgacct	tgccatcatag	tattcgatca	300
gattcagaag	atatctgttt	atttacgaag	gatgaacca	attcaactcc	tgaaaagaca	360
gaacaagttt	tatagaaagc	ttttaaacaa	gcatggaatt	aaaaccgggt	ctnaagatat	420
ctcctccaac	tctaaanaa	gaatataaat	cctatgaacc	aagctcgcct	tttaacagtt	480
tgattcttcn	tactgatcca	aaataagcgg	ttttacctcc	ttattgggag	acattnttta	540
aaaaagaaag	tccatntntg	naaccttttt	ccaaaatttn	tcagananac	atgctgnttg	600
gngacggctt	aaaatt					616

<210> 42

<211> 259
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(259)
 <223> n = A,T,C or G

<400> 42
 ngtacgggtcg gtggcagtg tttcttgaga tctgtagatg cttagaatat cagtattttg 60
 gatgttgctg cattttacaa tttatttgga gtcttccttn attttcctcc agatatatga 120
 aaatatgcaa tacctgctta tatcatgtag aaaagcttag caattattaa tttttctnta 180
 tttcatttta ttgacccaaa gtcgggtgctt cacttgactc antgtgtttt aggtgttngt 240
 nttntacct ttccggtca 259

<210> 43
 <211> 509
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(509)
 <223> n = A,T,C or G

<400> 43
 acgagtgtat ttttgatggg aaggccatgc taaatctata aaacagatgt ttcctctccc 60
 aacagtgggc accagtagtt tcaacttttt cccccagta gcatcaacca aacttagcat 120
 agtgattttt aactctttgc tcccacacgc actcatccca acttccccgc ttgccccact 180
 ccttgggggg aaataaccct gcctttaaaa taaatagcaa ccaagtgtc agttctatgg 240
 aaagtatgaa tatttatttc aggtcttoga tcccaatoga tttcaaaaaa caaagtctga 300
 tttctctcct cagagcagct gaggcctcca tgttacgatg gtttcatgga gattgaagga 360
 gcacatttca tcaggttag cacaaggtcc ctgatgccca ccattgcca gcctagnaa 420
 aggaaagaaa cagaattcac caccatgggg ctgaacgaat gccacaccta atgtaaatga 480
 ncagctaacc ttggccaaat tgtggtttt 509

<210> 44
 <211> 544
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(544)
 <223> n = A,T,C or G

<400> 44
 ttttttaaaa gtgtcactna ntctttaann anatncatta ccattttttt tncaaantaa 60
 attacgggtt taaanggaan acacatggna atntananaa ncaccgnga annttaanta 120
 cctngggngc gancanactn anggcgaatt cgaaccaatg ggggcngnaa cnaggggatc 180
 ccagctnggt accaaaattg gcgtnatgat cgcaatagcg gtacctgtgn naaanggtta 240
 ttcnntngta aaancagann tcntnnaagn nngacaaaa aangtaaata ctgggggtgcc 300

taatgannga	tntaaancna	ttaattgggn	tgcccacctg	cnantttatc	gttcaaaaac	360
ccgttaaactn	ngtgnaaaaa	tgaatngcca	accctnngga	aaagccgnat	cntttggng	420
cttttccttt	ttggctctna	cncttcttan	nngnnngttt	gggnnccgnt	nagttcntaa	480
aggcgnaaaa	catttacaaa	aataggggaa	ancccgaaaa	acattttacc	nagccacctt	540
ntcn						544

<210> 45
 <211> 630
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(630)
 <223> n = A,T,C or G

<400> 45						
ggtactctct	atcactgaca	aatgcaggct	ggattcttat	tatatacaga	gatggctcaa	60
aaatgggggt	tcagatcttt	gtgacgaaat	agaatactgt	ttcatatttg	aatcagaggg	120
cttcttggtc	tgagaaatag	gttcaaaaatc	attggaacca	ggaacaagaa	tagcttattg	180
ttatctgtga	taacactggt	ttctaaacac	aaggattttc	ttttttatta	atatgcaaca	240
tagacattgc	cataacagaa	taataaaacca	catgtggggg	tttaaaaatg	aaatttggt	300
aataggagca	attcagctat	ttttctatca	agaaaattgg	tggggtggga	tagaaagaaa	360
aaccgggttc	aacccccactt	ctgcccccta	accagctata	tggcctggat	ggagcattca	420
acctttaata	aggggtcaatt	tcntctgttn	aaaagacccc	aaacctggaa	atcacnttng	480
cctctccctg	aaaataanaa	ggctngattt	ttggaataan	aaacataatg	nangctnggc	540
ccaatggctc	gccccgtaat	ccaccctttg	gaggccangc	ggncggacac	ttgaggtagg	600
agttgaacca	cccgccacct	gggaaccenn				630

<210> 46
 <211> 622
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(622)
 <223> n = A,T,C or G

<400> 46						
tttttgactc	ccaaagtcac	tttatttaac	aaaggggtca	aggcagagga	aagtttccct	60
taatatcccc	acaactgctc	cacatgtctt	ctgtggaaac	acttcaccag	gaactagctc	120
aacactcttg	ctaacaatct	agtgtctata	caggaaggct	ggtgtctctg	ttacaggtgg	180
cccgttcctt	aaagccttta	gggttaatcg	cagctgcact	gagtggccaa	gcagaccctg	240
ttgggatgtg	aaagcagttt	gttaacaggg	cccctggccg	ggcccagagg	ctgtcagact	300
cancaagtaa	cactgaatgt	ccaaaaatac	ggctgtgtta	aactaacaag	ccaatccttc	360
tgtcagatc	tctggataga	aatgattttt	cttttatcta	tgggggaatg	caatttcac	420
acaacccttt	acataaacgc	tcctgaaacc	ctttcagtag	acagcatttc	aattcaaaaa	480
ccaaaagtga	aactatcttt	gaaaacangg	acctggctgg	gaaaccatgc	acacctcggc	540
gaacactttt	ccccccacg	aacttggact	ttntgggaag	gtggcggtt	tttggcnaaa	600
acattcttga	agcntaggaa	gg				622

<210> 47

<211> 253
 <212> DNA
 <213> Homo sapiens

<400> 47
 ggtacttttg tttgaaaaca acacttagag cctccagata acttttaaga cttatttagc 60
 tttgtgggtg gtattttcat gcaaataagt aaggggtgggt tttatatattt gtagaagttt 120
 tcggtcctat tttaatgctc tttgtatggc agtatgtata tattgtgtta agttcctcaa 180
 gaatctcctt aaaaactttg aagttaatac ttttgtgcaa ctgtgttttg aataaagcca 240
 tgacagtgtt aaa 253

<210> 48
 <211> 607
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(607)
 <223> n = A,T,C or G

<400> 48
 acttacatat cctacatttg actacattat ttccaaacca agtattccat ccaaaggaac 60
 atactgctat catagagacc aaggagggac tgtttaaagt tgccaagggtg aagcgagctg 120
 agaggctttg tcctcgtgcc agtaactctg aaattttctt taattcctgc tgtccaggca 180
 gcagaatgcc atggtttccc caagtaggta gctgctttag cagttaaagc ccaaagtctt 240
 gttctgttga tcaagaggtc tctgaatttc tgaagtgggtg ttctgtttct ggtgactgag 300
 ttaatccttt acaatncctc ttgtaaagtg tgctaataga aagaatccac ctttcaaagc 360
 tgcagaacca naccgtgccc taaattgacc aaccgtanct gatgtgctn angaagtctt 420
 ttgccaaactg ccctgtgaan acccctnctt cccccagct ngtggcttgc acactgaaca 480
 tttaaactgn gcaaagccgt gtagttataa nacagtaaat cccaaggctt ggttaantgc 540
 tgggnnaaaa ctggttgat anacttaact taaaaccctt tacataaacn tnggaactcn 600
 aagaaaa 607

<210> 49
 <211> 421
 <212> DNA
 <213> Homo sapiens

<400> 49
 ggtaccactg gatgaggggc cgggacatac tgactgcccc tttgacccca caagaatcta 60
 tgatacagcc ttggctctct ggatcccttc tttgctcatg tctgcagggg aggctgctct 120
 atctggttac tgctgtgtgg ctgcactcac tctacgtgga gttgggccct gcaggaagga 180
 cggacttcag gggcagctag aggaaatgac agagcttgaa tctcctaaat gtaaaaggca 240
 ggaaaatgag cagctactgg atcaaaatca agaaatccgg gcacacaga gaagtgggt 300
 ttaggacagg tgctgttccc gagactcagt cctaaagggt ttttttccca ctaagcaagg 360
 ggccctgacc tcgggatgag ataacaaatt gtaataaaag taacttctct tttctttcaa 420
 a 421

<210> 50
 <211> 624
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(624)
 <223> n = A,T,C or G

<400> 50
 ggtacttcag tattgcattc tattectctt aatgttttta tgggatctcc agggaaagag 60
 gaaaatgaaa accgtgatct aacagctgag tctaagaaaa tatatatggg aaaacaggaa 120
 tctaaagact ctttcaaaca gttagcaaag ttggtcacat ctggtgctga aagtggaaat 180
 ctaaatacct ctccatcatc taaccaaaca agaaattctg agaaatttga aaagccagag 240
 aatgaaattg aagcccagtt gatatgtgaa cccccaatca atggatcctc aactccaaat 300
 ccaaagatag catcttctgt cactgctgga gttgccagtt cactctcaga aaaaatagcc 360
 gacagcattg gaaataaccg gcaaaatgca ccattgactt ccattcaaat tcgtttattc 420
 aaacatgatc aagaaacggt ggatgacttt aaaaaanatg ccntaaggac anttgtgatt 480
 tgcaggtggg aagatnaaca gttcatatcc actgaatgaa atgcatcttg tggaaganct 540
 catgnatnaa ggtaaatggc tgaaatgaaa actccaaaag aaaccaaaaa ataccggccc 600
 ctttgaaatt caggganncc tatg 624

<210> 51
 <211> 632
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(632)
 <223> n = A,T,C or G

<400> 51
 ggtacgcggg ggaaacggaa gtgagcggcg gggctgactg acggtaacgg ggcagagagg 60
 ctgttcgcag agctgcggaa gatgaatgcc agaggacttg gatctgagct aaaggacagt 120
 attccagtta ctgaactttc agcaagtgga ccttttgaaa gtcattgatct tcttcggaaa 180
 gggttttctt gtgtgaaaaa tgaacttttg cctagtcate cccttgaatt atcaagaaaa 240
 aaatttccag ctcaaccnaa gataaaatga attttttccc cctgaagaaa cattcagggc 300
 tatttttgctt cccttaaaat accagaatgg gattcaaggg cagtgccacc aggtcaaccg 360
 ctttcatttc tttcaagcct caaatctttc acttgaatgt ttgaagggtg atggatgaag 420
 acctattgga attgagggat atctttaatg atccgcccc aaccgaatcc ttggaaaagc 480
 cacccttgat ggtggaatat aaccttggtt actgaatatg tgcctgtcat ggaaccgagg 540
 ccgcatctgg ttatagcatc tttgacctgc cggccgcccc aaaggcgaat ccacncctgc 600
 ggccgttcta tggaccaact cggnccaact gn 632

<210> 52
 <211> 623
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(623)
 <223> n = A,T,C or G

<400> 52

acttttaatg	gtgggaattt	acagtagaag	catcctttgc	tgagttatac	attcctttat	60
caatctcttt	tgatacaaca	tttaaaacaa	gtagcttcaa	gaaaccactg	gtgttttgag	120
gatagtat	ctaaatagca	ttcaggaaca	gagtattatt	gcacagatct	gaagatcaaa	180
aaaaagctca	aggaaataca	gatcggaagt	gctgatgagt	tatatattat	gaaaacccaa	240
cttttaagga	agtgcctaaga	tcagtcaccc	atgtgaataa	gaagccagga	aaggaaagat	300
ggggaaagcc	canatcacca	ggcttctatt	aaggaggaaa	gcaacagang	aaacagtga	360
agggaacaga	aaggggtagc	caagtgttac	aaaaaanccg	actggataac	caaactncaa	420
aaagngtatg	ttggggagaa	ctgaaangga	aaacaaaata	cttgactaat	cntaagtaga	480
aaaaagcagn	tagagaaaac	caaataattc	tggncctgtc	acatacaact	tcaaataccc	540
ttatanaatc	caaaaatgat	gtgtgtaagg	naaaatttat	tgcctccga	aaaataantt	600
tntccaatnt	gaaacaaatc	aac				623

<210> 53
 <211> 627
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc feature
 <222> (1)...(627)
 <223> n = A,T,C or G

<400> 53						
ggtacgcggg	gtcgcatgcg	ctgtggctaa	tgccgtaggc	tctttcaggg	ctgagccatc	60
ctgcgtgtct	tgcgctcgg	ggaaatgcc	agccgagga	cgcgaccaga	ggacagctct	120
gtgctgatcc	ccaccgacaa	ttcgaccca	cacaaggagg	atctaagcag	caagattaaa	180
gaacaaaaaa	ttgtgggtga	tgaactttct	aaccttaaga	agaataggaa	agtatatagg	240
caacaacaga	acagcaatat	attctttctt	gcagaccgaa	cagaaatgct	gtctgagagc	300
aagaatatat	tggatgaact	gaaaaaagaa	taccaagaaa	tagaaaactt	agacaagacc	360
aaaatcaaga	aatagtcaac	ctgattttcac	ataacaatgt	gtggcatttg	ttgttctgta	420
aacttttctg	ctgagcattt	cagtcaagat	ttaaaagagg	acttactata	taatcttaaa	480
cagcggggac	ccaatagtag	taaacaattg	gtaaagtctg	atgttaacta	ccagtgnnta	540
ttttctgntc	acgtntcaca	cttgangggg	gtttgactac	ccancctgtg	gaagaagaaa	600
gaagcaatgn	ggttctatgg	atggaga				627

<210> 54
 <211> 565
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(565)
 <223> n = A,T,C or G

<400> 54						
ttttccttga	gtgctccctt	ttatgtcatt	ttattttctt	ttatgcagac	cagtgggggg	60
aaaatcccat	agattcttct	ggaaactgtc	aagatgctgg	gaagatgaat	gcaaaactta	120
catagattgg	gatgtccaca	gtttggattt	tcaaggtatg	gcttttgcag	gatgacgtga	180
tcaacccaaa	cttctgcttg	atctggtttg	tctgaactc	ctgccacttg	ccgccaacca	240
gggcctctgc	tctgatctca	tacttcacca	ggcgtgccgn	tcgcaggctg	acgtggttgt	300
gctcgtagac	cgcagagggg	gattccaggt	ctgtgtgctt	tattctctgc	atgtaaaaac	360
tataagaggt	agtatcatgt	ttgagtcctt	ttatcttaaa	gaagaatcca	tatagagcaa	420

tcgttttcga	ataagttgna	ttctctgngt	ctggcactgt	gtccagtgt	ctcanaggat	480
gcangggaga	anaccaaaaa	gtntctgagc	agtctcacat	gggaaataaa	atgtgtcccc	540
ggtaccttgg	ccgngaacac	nctaa				565

<210> 55
 <211> 451
 <212> DNA
 <213> Homo sapiens

<400> 55						
acagagatga	caagagaaa	gcacaaatga	ccggagtcag	ggattgtggt	gagggctcca	60
catgaagaca	gcatgttgga	ggagaccaag	ttgggaagg	tgacatgtca	tacatcaaaa	120
gttgcccaa	gatagcagg	tataatgggc	tagagagaaa	ttagaggga	catctcttcc	180
ttcacttgaa	caacaccaa	aatagaagac	cagagaatag	aaggatggtg	acaaatccca	240
aaaaggaaat	ggaggaggag	ttcgtggaag	ggcagaaaaca	ctttaatcct	agaggaggag	300
tgaggcactg	ttgaaaagag	aagcaaactt	tggcaggggt	ggccattctg	ccttgctgag	360
tcatgggctg	agatacggaa	gtcactttca	atcattttct	acttctccca	gggcactcag	420
acaaaatcag	tgcaagggtat	atggaagtac	c			451

<210> 56
 <211> 623
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(623)
 <223> n = A,T,C or G

<400> 56						
ggtacgcggg	gcttccgaga	cgcactgggg	gccggatgta	gaatcctgct	tatctgtgaa	60
atgcagttaa	cacatcagct	ggacctat	cccgaatgca	gggtaaccct	tctgttat	120
aaagatgtaa	aaaatgcggg	agacttgaga	agaaaggcca	tggaaggcac	catcgatgga	180
tactgataa	atcctacagt	gtttcactct	tggtgccag	gctggagtgc	aatggcgcca	240
tcttggtca	cggcaacctc	tgccctccgg	gttcaagcaa	ttgtcctgcc	tcagcctcct	300
gagttgctgg	gattacagat	tggtgatcca	tttcagatac	ttgtggcagc	aaacaaagca	360
gttcacctct	acaaactggg	aaaaatgaag	acaagaactc	tatctactga	aattat	420
aacctttccc	caaataacaa	tatttcagag	ctttgaaaaa	atttggtatc	tcaacaaatg	480
acacttcaat	tctaantgnt	tacattgaan	aaggagagaaa	acnataaatc	angaatacct	540
aatatcttca	gtngaanggc	atcaagggtc	tcttgaaaac	ttnccggaat	aatgaatntn	600
ccnaagtcca	aaanattttt	aac				623

<210> 57
 <211> 622
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(622)
 <223> n = A,T,C or G

<400> 57

```

cgaggtacttt tttttttttt tttttttttt tttgggtttct gtcctttaat tttttaacag      60
aatatacaga gccacacaat acgatttcaa tttcaaatta tgggagatca tattcaaata      120
tgcttaggtt tgacaagttg ctgttacaat actgagaact ttcataaaaa cggatatttaa      180
caattttttta gataatcaaa tatctttttg ctacgtgggc caacgcatta atactaactt      240
gtttaaaaaat gcagtcctttt agacttcaaa ttattataaaa acaatatcaa gatcatatag      300
atatacttcc tgattactca aaactcgttc cattctgatg gaggctgaag gtaaagtgtta      360
ttatacatta gaacattttca tgaaaccact tctcctttgc acttacctgt aaaagtcaaa      420
aattaaacca caatttccta agacataact atttctagaa tacattgggtg taatcataaaa      480
agactaccng taaattatca tttttatcta acacttttta ccacacacat ctttcctaaa      540
aggaccnaaa aaaattggga atttggttc cttacataac aggactcata cttctgattt      600
aataaattnc actcttttca ag                                     622

```

<210> 58
 <211> 471
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(471)
 <223> n = A,T,C or G

```

<400> 58
ggtacttttt ttttgtttgt tttctagact taataaaagc ttaggattaa ttagaagaag      60
caatctagtt aaatttccca tttgtatttt attttcttga atactttttt catagttatt      120
tgtttaaaaa gatttaaaaa tcattgcact ttggtcagaa aaataataaa tatatcttat      180
aatggtttga ttcccttctt tgctattttt attcagtaga tttttgtttg gcatcatgtt      240
gaagcacccg aaagataaat gattttttaa aggcataaga gtccaaagga atattctttt      300
acaccaattc ttctttttaa aatctctgag gaatttggtt tcgccttact tttttttctt      360
ctgtcacaaat gctaagtggg atccgaggtt cttaatatga gatttaaaat cttaaaatgn      420
ttcttatttt cagcacttac atcatttggg acctgcengg cggccgntcg a               471

```

<210> 59
 <211> 618
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(618)
 <223> n = A,T,C or G

```

<400> 59
ggtacataca caatcactca actggaacaa tcaaaaccat ctatgagtgt gggtattataa      60
aaataaaaatt acgttcatac aatggtagaa aatgaaatgt ttttattaat ttgattatta      120
atacaaaacc acacatatat gaattatata acctagtgtt atatatttaa aaatctttat      180
gcttgcaact gaaatgtctc tactccaagg gaagtttctg atttttaatt ttcttatttt      240
aaggaatcta ttatattcac aatgattaaa atgccttaca cataggcaaa aagcagaccc      300
aatcccagca aacagaaaaa ccataagtct atcatatcac catatgtttc accatatagt      360
tttgaaaaat aatcctattt gcagtttggg atgtcttcat atttatactt attatcaaag      420
tgattgcata ttgaggcaca gagcttaaag aggaaatata tattacttat aggggaacca      480
gacactgaaa caaggaatat caatcaatgg cttcaaacna aaaaaaaann nnnnnnnnnn      540
nnnnnnngaa aaggaaaagt cctgncccgg cggncgttca aagggcnaat tcaaccactg      600

```

ggggccgtac ttatggac

618

<210> 60
 <211> 606
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(606)
 <223> n = A,T,C or G

<400> 60
 acttttttaa cctcccaac cagccctttc tcaatattca tcaaactctaa aacatttagg 60
 gggcaaaatt ctaacatggt catgggtatct tgcaaatagt aaaagcttta ttctgaagga 120
 ttataaacta gttttctcca ttttaactag cactattttg tggaaattag aaacctcttt 180
 tatttctctt cccaaaagta atacttatta taaggctgta gtatcagggt aaggatacag 240
 ataaataaag ttcacttata tcttcttaca aatgtctggg ttttaatatg gttaatcact 300
 tatatacaaa tattacaact ttttagtgca agtttttgga agaaaacttt ttgataaaac 360
 actgtgattg atgtgacttt atttttaatt taaacgatga ggtggccaga agaaagatgg 420
 gtctaaaatt tctcccatga aagatgtaaa actatggctt ttttaaaatc aaaatttcat 480
 ctttaaaata atgggttgaa atctggatng gatctgaaca gaataatcac atttaggatc 540
 tatataaatc tcaactggag tntaactgaa ggaaataccn ngattttaag aaatatnttc 600
 aaaaan 606

<210> 61
 <211> 620
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(620)
 <223> n = A,T,C or G

<400> 61
 ggtacattct ggtatgaaaa catctcaaaa tgtaacaaca caagagtttg ggtcaagacg 60
 acccaccag gaggtgtgaa aaactgggtt gaactagaac tgtggaatgg aactagttaa 120
 aaatatgaag cagctctaaa caccaagctt agagacattt gccctattag aaaacaaaaa 180
 tcattaaagc tacaaaataa caagtgcata catgctgaac ctgtttccag ggagtgcacat 240
 tcccttctgc caacagggtc caaactcaca cccacaagggt gtaactctct ttctgttcc 300
 actagatttc ctttctctca tctcaaaggc cctcagaaat gacaatggaa aacgtatgaa 360
 ttgttgaaat ttaccctgtg gaccaattcc tgaagagata acagccacaa ctctgagatg 420
 attaagacat gcagtgttta cttgatgact ttctgnattt ctagaaaccc tcaaagcatt 480
 aaactgncta tttcaaaatc taaacttntc agcactttta ttatttgagg taagcnnacc 540
 gaagacaatt tactggccca caggaataac cacgcttact tgtcaccata agtttacggn 600
 atggacattc actggaaaa 620

<210> 62
 <211> 614
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(614)
 <223> n = A,T,C or G

<400> 62
 gccgaggtac ataaatctgt gateccattt cttattgcac cattcaggaa cactttatat 60
 aaatgagtgg ctttttattt catattatta gtagtatcat gggtccatta caggcctatt 120
 aacatcatag attgtcatta gtctttgaag aaaaaatatg taaatatata tgtgtaacat 180
 gagaatttct ctctaaagca gggcttaaaa ttttttgaa aagtttgaca aagcatacca 240
 catgaattca gatttacctc aatgctaaga attatgttta gttaggaaaa aggaaagtca 300
 ttttgacctc aggtagaaaa atagattgct ttgagtttta tgtagcttta gactttaaaa 360
 agttagaatt tattctgtaa ctaaaaatta tttgaaaaaa ttatgcctct gggttaatta 420
 ttggtgatta cacactcttt ctcttacctc tnggtattga actatgtcca taatcaagtt 480
 gatgtggatc ctgaaaaaatg gtatgaacat ctgatgggat tggcacatta ttttaaaant 540
 agcatctgac acttcaaaac tgtcantgng atggggtcac cataccacgg ntgacntac 600
 attaaatttt nacn 614

<210> 63
 <211> 616
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(616)
 <223> n = A,T,C or G

<400> 63
 ggtacatata agagtaatta gttttattct ctctttttta taaaatcggg tttcagatga 60
 gatgtttatc ttagactatt ttagggaaaa atttttacatg tttgagatgg tggagtaaaa 120
 agactgttaa acatttcttt taaaaaatta tttttacatt acaacaatat atttatgatg 180
 tgttcagatc aaaaattttaa ctctgtgtc ccagatctac tttcaaagtg agattttcac 240
 ttgtcagctt aaatttctga ctagaactaa catttgtgta tttttgtgct tagtcggaat 300
 acaaatttca cagtggattt ttgaagtttg tccttaaatt ggataaaatc aagtgattaa 360
 agttactaaa gagataaaaa tggtaatttc cattttttaa agtaatttgg ttgtgtttat 420
 agttatttgt acttcagatc tcccttcacc atttccgacg gcatctacng ctcaacattt 480
 tttggtaacc cangctttca cggacttcac gtcattattg gctcaacttt cctcactatc 540
 tacttcatcc gccactaata tttcctttac atccaacatc ctttgacttt naagccgccg 600
 ctgatnctgc attttt 616

<210> 64
 <211> 612
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(612)
 <223> n = A,T,C or G

<400> 64
 ggtacagata tcattncttg tgtatgccat gacttgaaaa agtttgggaa gctctttanc 60

```

aatatcagct aanaggatat gaaatcacag gtgatagcag ttgtcattca gtaatttcct 120
acaagcagca ccccaaagga aatatagtc taatctttac tatccacttc taaatttaaat 180
gtgaatttca tacatgttat tagttgtttc ctttataatt ttataaaaat tattcatcgg 240
gagtttaact tccacttcca tgctatcgga tgtgttgggc tccatgcaag aacttggaag 300
aaaaacaggc aggaatgcat ttgcataatg acccagatca tcattttctg caactgagaa 360
ttatatattca tcattgtctc tagaagtctg caattcttta cttttctttg gtgcattatt 420
atctangtgc ccatcactgg ataatgtgga gtgactagag aagtcantna tcactggaag 480
gncctgcccn ggcgccgctt caaaaggnc antccagcan nctggcggcc gttctaattg 540
gntccaactt ngggnccaan cttggngnan tcatggcnta acnngttccn ggggggaaat 600
gntntccctc ac 612

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<210> 65
<211> 599
<212> DNA
<213> Homo sapiens

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<220>
<221> misc_feature
<222> (1)...(599)
<223> n = A,T,C or G

```

```

<400> 65
acaagctaca aaatagcatc tctttcatgg tatgtttgag tgtgtaattt tagtttcttt 60
tctgggtgta tttgtggtag tcagatgtgt tggattgatt ccaactggac agagtaagga 120
attccagcat cctcttctgt cttgtctgtg ttacccaca gatcaaacc tcaattctag 180
ttggggatgc tgtctagccc cacaccatga ctgaagcctt aagcactgtt gcgcctccat 240
gtgctttggg tcagcaaccc cagtgggtatt ctaccagagc attgtgggaa ggcagatgta 300
tagtcaggtc ccaacagcaa attgttgggt gtgagagtgc taaagtatag ggggtaaggg 360
aaagagaang atatgaactc ctctgacctt aaccacattc atttaacttt tatgcctact 420
taacaagaga acctggagaa aactatcgna ttcaagagat taatcaaaat cagggtttan 480
ccagccatga ccgaaancnc cttccttaac ctcatcttgn anggctgnaa naattcannc 540
ctaggatggt taanccagaa cccngatga ttaantgtcc aaccttnatt tncatantn 599

```

```

<210> 66
<211> 611
<212> DNA
<213> Homo sapiens

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```

<220>
<221> misc_feature
<222> (1)...(611)
<223> n = A,T,C or G

```

```

<400> 66
ncatgacctt tagtgaaga ttatttggtc atcaaatacc catatccaag tttccatggg 60
gcctgggaat ttcttttcac ttggatagaa agtatatat aggaaagtcc agttaataag 120
tatttttatt taaaaaaaaa aaaaaaggaa aaaagaatca gcagaagtca agttgtctta 180
agtcttaagg ctttctggat ttcttcttg gaggaggtca ggatcttccc aaggcctggg 240
tctctgaata ttcttccagt catcaaaact ggagtctttg attttctcat attccgactc 300
taaagatatt ttattctctt tcagtttttt ttcaagctca ggatccattt tactcttcac 360
agcatcatat cggattttgag aaaactcacg aagacaaaaa gaaccttcaa caatcagcaa 420
caacatgggg actccatacc cagagtcttg gtcttgcgaa aagcacgcnt naaccgcggg 480
tgccaacatg agtgaactct ttcacgggt naaactccaa cnggcctacg caaactccca 540

```

atttacaggt tangctttta ccaaacaagt nccctnggcgg gacnccctag ggggaattcgc 600
cactgggggg t 611

<210> 67
<211> 639
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(639)
<223> n = A,T,C or G

<400> 67
nagaattcgn gcttncnagc ggtcgncgg gcaggtacac tttacttaaa aactattaac 60
agtttttcat gttgcactgg tggtaathtt gaacttggaa ttactgggtg ggaattccag 120
gaaccacaga gtattgattt ttgctgccaa aatgctcttg aagcagatgt cctgtgctc 180
ccctggctgc ttctggctga aggggggagg tgtagactga agcttgggca ctcatgtgtg 240
tcccccccca gtccccatcc tagtggggcc agtctcatta ggcagccata gataagcctg 300
gaacttggct gcattagtga cttgatcctg gtatgaaatg catactgggt ataaagntgc 360
tcaagnattt tatttccttg gccacaactt ccatagatgc caatggtttg atagcctcag 420
tttctnaacg atgtcttttg gttacagtgc tcacttantg ngagtcaaga aatgcttgag 480
ttaccagaaa cttcttantc aggttgagta acnttttacn ttcatngta nctnnggcgc 540
gaacaccctt anggggaatt ccacacactt ggnggccgta ctaanggatc caacttgggn 600
ccaacttggg ggaaaaangg cnaantgggt ccttngnaa 639

<210> 68
<211> 611
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(611)
<223> n = A,T,C or G

<400> 68
tcgaccggcc gcccgccng gnccttcccc atcactnnac tggnacnate aaaaccntct 60
atgantgngg gtattaaaaa ataaaattac gttcatacna tggtagaaaa tgaaatgntt 120
ttattaathtt gattattaat acaaaaccac acatatatga attatataac ctagtntat 180
atatttaaaa atctttatgc ttgcaactga aatgtctcta ctccaagga agtttctgat 240
ttttaathtt cttattttta ggaatctatt atattcaca tgattaaaat gccttacaca 300
taggcnaaaa gcagacccaa tcccagcaaa cagaaaaacc ntaagtctat catatcacca 360
tatgtttcac cntatagttt tgaaaaataa tcctatttgc agtttggat gnttcatat 420
ttatacttat tatccaagt atgcntattg angnccnaag cttaagang gaattttntt 480
cctatngggg acccnaccct tgaccgaat tcatcaangg nttaaccca aaaaaaann 540
aaaaaaaaat ggnaangggg ctcccttnaa ancccccca acctntttnt ttaacnagnc 600
tnagcctttc a 611

<210> 69
<211> 606
<212> DNA
<213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(606)
 <223> n = A,T,C or G

<400> 69
 accaaagcat taccgcgcatg gtagagaaca cactcggatta aaaatgttaa gctatctgaa 60
 aaataaaatg tgcaagtctt caggatggca caaaacaaag gtcaatgctt cttggggcac 120
 atttcttaga gggcttgctg agtgtgtaaa tataatcgac ttttgttgt gttacatgac 180
 ttctgtgact tcattgaaaa tctgcacaat tcagtttcag ctctggatta cttcagttga 240
 cctttgtgaa gggtttttatc tgtgtagaat ggggtgttga cttgttttaa cctattaaat 300
 ttttattttc tttcactctg tattaaaagt aaaacttact aaaagaaaag aagtttgtgt 360
 tcacattaaa tgggttttgt ttggcttctt ttaatcaggc tttctgaaca ttgagatata 420
 ctgaacttag agctcttcaa tcctaagaat ttcattgaaa gncntnact ttgaacccaa 480
 accanaatac ctgcggccgga caccctaagg cgaattccag ccactggcng gccgtactaa 540
 nggatccanc ttggtnccaa cttggggnaa catggcnaac tggttccggg gaaatggatc 600
 cccnncn 606

<210> 70
 <211> 611
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(611)
 <223> n = A,T,C or G

<400> 70
 ncgtggncgc ggccgaggtg cttttttttt tttttttttt ttttttttnn aaaangggta 60
 accttaaagg tttantggcc ccccaaangn aacctggggg taatggcttc nnattttaaa 120
 tttttggaaa ttaaaaaaat tacnagtgtt aaatagccna tggctggnta tgttttcana 180
 aaacatgatt agactaatc attaatgggg gcttcaagct tttccttatt ggctccanaa 240
 aattcacccn ccttttgncc cttcttaaaa aactggaatg ttggcatgca tttgacttca 300
 cactctgaag caacatcctg acagtcaccc ncatntactt caaggaatat ccggttggat 360
 acttttcana aagggaatga aagaaaggct tgatcatttt gcaaggggccc caccacgtgg 420
 gcgganaaat cacttctaca ggttattacc tgganngtca aagntttctg naaaacanct 480
 tgctctcaac tggtttacca tttgggtgctg gagctnacaa ccggtttaag gcccttggn 540
 anggtccaag ncccaanaaa ctttcccggg ccttccggng gccttnaagg gaatccnccc 600
 tgggggcggt t 611

<210> 71
 <211> 588
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(588)
 <223> n = A,T,C or G

<400> 71

+24

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nctgggaacn ccgaaggtgg aaggccnttt cataacattt cttgtggatc aaaccaccgg      60
gacacctttt ttnccatcaa caggactagc gtcttgtcag tcttgggtgac agtgacattg      120
aangtggggg cccaccggtg ctcttggtac tttccaaga ggtcctcacc ctgagacggg      180
ctctacccat gtttaaccca aagagtgcag gccagggtcc ttatccttct gatgaaggat      240
gagagaactc atttagaagt cagagcaaac taggggtctca gtattgagaa acgcacctgc      300
canggaatca cagagacatc ggggtgcccg cgatggcctc atgaaccatg cctngacggg      360
attcaggaac cctgcaaacg tgctttttga ctcatgggnc agtgtgaatt ttacacaagg      420
naaacctggg cnaaggcatt ngggaattgc tccaacnnat acttcctntt aggaacccaa      480
ggaancaggt tcncgaattt tgaaaactgg gtntgaagtt ctttcttcct ttgggnacaa      540
ggccttaaca aanancttgn ggnttccaaa tggncctggc cccacacc      588

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<210> 72

<211> 591

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(591)

<223> n = A,T,C or G

<400> 72

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ggtacaaact tagaagaaaa ttggaagata gaaacaagat agaaaaatgaa aatattgtca      60
agagtttcag atagaaaaatg aaaaacaagc taagacaagt attggagaag tatagaagat      120
agaaaaatat aaagccaaaaa attggataaa atagcactga aaaaatgagg aaattattgg      180
taaccaattt attttaaaag cccatcaatt taatttctgg tgggtgcagaa gttagaagg      240
aaagcttgag aagatgaggg tgtttacgta gaccagaacc aatttagaag aatacttgaa      300
gctagaaggg gaagttgggtt aaaaatcaca tcaaaaagct actaaaagga ctggtgtaat      360
ttaaaaaaaa ctaaggcaga aggccttttg aagagttaga agaatttgga aggccttaaa      420
tatagtagct tagtttgaaa aatgtgaagg actttcgtaa cggaagtaat tcaagatcaa      480
gagtaattac ccacttaatg gttttgcctt ngacttttg gttaagaata tttttaaatc      540
ctgnggctnc cttaattggc cgnttgncca ngggttccnn aaatgggttc n      591

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<210> 73

<211> 581

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(581)

<223> n = A,T,C or G

<400> 73

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acgcgggtat ctgtaatttt tataattcat caattctgga atgctatata taatatttaa      60
aagacttttt aaatgtgttt aatttcatca tcgtaaaaaag ggatcatctc agagagaaca      120
gcagtattct gcgtattttt aaaaatgctc tagagtaaca tttgaagtaa ttcactgtag      180
tgtatgccag tcctagaaat aattttttta atttctgggt tctgtttcta atacactaac      240
caagttttca aaatatattt acaaagatgc atctttaccc attattttta aatgattaag      300
gaggatagtt gcttcaggta acaagctaatt ttttcaaata ttaggccctt acagaactat      360
ttagtcaaaa agtaagatat tcctttaaaa tatataaccc aaagctttca gttaaacat      420
gatatatcac aaatactatt aaaatggtaa agagaaaatg caattgcant taatgatgcc      480
caaatngtaa aatatngaga ttcaaaaagct gggnccttat ttaggnggga tnccaatggn      540

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aatgatactg gcctggnttt acctttacct tttaaaaaan a

581

<210> 74
 <211> 599
 <212> DNA
 <213> Homo sapiens
 <220>
 <221> misc_feature
 <222> (1)...(599)
 <223> n = A,T,C or G

<400> 74
 cgaggtactt tttccgcaca tgccttggtc ctatctgagt attgatgcca tggatgtggc 60
 cggagaacag cagctggatg tggaaacacaa cctgttcaag caacgactag ataaagatgg 120
 catccccgtg agctcagagg ctgagcggca tgagcttggg aaagtcgagg tgacgggtgtt 180
 tgacctgac tccctggacc ctgatcgctg tgagagctgc tatggtgctg aggcagaaga 240
 tatcaagtgc tctaacacct gtgaagatgt gcgggaggca tatcgcccgt anaagctggg 300
 ccttcaagaa cccagatact attgagcagt gccggcgaag agggcttcag ccagaagatg 360
 caggaaccag aagaatgaag ctgccangtg tatggctttc ttggaaagtc aaataagggtg 420
 gcccgaaact ttcactttgc ccttggggaa ganccttcca gcantcccat gtcacntcat 480
 tgacttggca aactttggnc ttgacaaccn tnaccatgac ccactacatc ancacctgtc 540
 atttngggga ggactttcna gccttgggaa acccctngac cccccaatgg taattggcc 599

<210> 75
 <211> 594
 <212> DNA
 <213> Homo sapiens
 <220>
 <221> misc_feature
 <222> (1)...(594)
 <223> n = A,T,C or G

<400> 75
 acatcaaatt ataaatgcaa aacaggttca gatttcatct tttgtgattt cttttaaata 60
 ctattcattt ttatttaaatt gcacagtatt tcccctatat tttagtcctt ccattcctag 120
 agacaaacca gttatttggg ggtgggaagt agctgaagca aagaaggaaa agtaatacct 180
 ttaacctcac tagcttcaag agtagacatt cttactagct caattttaaatt aattgatttt 240
 aaataggaag aaaagaggat atattttaaga tacatagaaa ttatgatgtg aagtattcat 300
 gagaatctgt agattccatc aaaataagta ggaactcatc taaaattgtt ggattttaaag 360
 aggcactttt ggttatgatt caaatatggg gaatttgaga aatattcatt ttgnccactg 420
 gatggtcact attttactaa aanggnagct ttttatgggg ggactgngac tgagggtctta 480
 aagactgaaa gaagttgggg ggttcatttt cngtaccacc ttcnnggacc atttgacact 540
 ttggccggga acaccctaa ggngnaattn cngnccctgg gggccgtcta atgg 594

<210> 76
 <211> 585
 <212> DNA
 <213> Homo sapiens
 <220>
 <221> misc_feature

<222> (1) ... (585)

<223> n = A,T,C or G

<400> 76

acgcgggggg	cggagtagca	agtggccatg	gggagcctca	gcggtctgcg	cctggtagca	60
ggaagctgtt	ttaggttatg	tgaagagat	gtttcctcat	ctctaaggct	taccagaagc	120
tctgatttga	agagaataaa	tggattttgc	acaaaaccac	aggaaagtcc	cggagctcca	180
tcccgcactt	acaacagagt	gcctttacac	aaacctacgg	attggcagaa	aaagatcctc	240
atatggtcag	gtcgccttcaa	aaaggaagat	gaaatcccag	agactgtctc	gttggagatg	300
cttgatgctg	caaagaacaa	gatgcgagtg	aagatcagct	atctaattgat	tgccctgacg	360
gtggtaggat	gcattcttcat	ggttattgag	ggcaagaagg	ctgcccaga	cacgagactt	420
ttaccaagct	tgaacttana	aaagaaagct	cgtcttgaaa	gangaagcnc	tntgaaggcc	480
aaaacagagt	acanaagttt	ccnngttggc	ttggattttg	aaaattcnng	aattntntat	540
aacgggcttn	tttaaaaagg	atnggnttan	gnacctttnt	taaat		585

<210> 77

<211> 591

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1) ... (591)

<223> n = A,T,C or G

<400> 77

ggtacgcggg	agtcataatt	atgaaaaaag	gtttgtgttt	tactcttgct	agtgagaaag	60
tgggacaaaa	tatacttttg	aaataaaaatg	ctatatggca	cttaattatt	ttttctttta	120
aaatgcctta	agttgcagtc	tcattttgat	aatcatttgc	ttccagtgtt	taaaaattaa	180
aaaaagaatg	gggagaagg	tatgagaaga	gcattattaa	gtttccaaat	ttaatttgaa	240
ttccaaattc	acctagcaat	aaaatcta	ttttaaaaaag	tatatataa	taaaatgtat	300
aaatgatgga	tagatttttg	tattgatattg	caaaatgcag	attataattg	ataggctata	360
gtatgtagat	attcctttta	ggaatattac	agctgtaaat	tatatgagac	ttgccagtca	420
aatgctat	ggtttaaaaa	aattatttgc	atctcaagtt	aatggaatat	ttttaaatcc	480
cacattcaga	gttaaaacct	ngttttcaat	gggtttttan	tgtggcactt	gnttatagat	540
taatttttaa	taacctgttn	ggaancnggg	ccttttaact	ggtccttggg	g	591

<210> 78

<211> 252

<212> DNA

<213> Homo sapiens

<400> 78

actgagaagt	atthttcagt	attcgaccca	gaccagattt	caacacatgg	ttcccataca	60
ggaaggactg	ctctgcacca	ggctttatcc	aaactttata	cttggcataa	ggtgcaaggt	120
aatccagagc	tgtgacgtgc	aaccgaaact	tgtgggtttt	agtgaatttt	ccaaagcagg	180
tccccagcga	caccagcttg	tccccgga	tattggcggc	cagcttcata	atcttctcac	240
tcacatagta	cc					252

<210> 79

<211> 571

<212> DNA

<213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(571)
 <223> n = A,T,C or G

<400> 79
 gctcgggcaa gcactttaac cttttaagcc caaccagatg agttgcctgc agttttggag 60
 gccttcagag catttcacta gacctctgtc tgtgtcggtc cagtgtcttt agccaagctt 120
 tgattaaaga tgacttcctt gtttgctcaa gaaattcgcc tttctaaaag acatgaagaa 180
 atagtatcac aaagattaat gttacttcaa caaatggaga ataaattggg tgatcaacac 240
 acagaaaagg catctcaact ccaaactgtt gagactgctt ttaaaaggaa ccttagtctt 300
 ttaaaggata tagaagcagc agaaaagtca ctacagacca ggattcaccc acttccacgg 360
 cctgaggtgg tttctcttga actcgttact gggcatcagt agaagaatat attcccaaatt 420
 ngggacaagt tcttttagga agaccctta tccttttgcg ggtgaaaatc aaaatgaagc 480
 nnaaaatccc ttcaaaatga ggccaacgan taactttttt aaatggcttt tcaaaaagcc 540
 ntgttaatta ancttnantg taaaggnttt t 571

<210> 80
 <211> 595
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(595)
 <223> n = A,T,C or G

<400> 80
 acctcttctt gttcgaatgg gttatccagt aaaaaagggc gtgcccattgg caaaggagggg 60
 aaatctagaa cttttaaaga ttcccaattt tctgcatttg actcctgtag caattaaaaa 120
 gcactgtgaa gcccttaaag atttttgcac tgagtggcca gccgcactgg acagtgcaga 180
 gaaatgtgag aagcattttc caattgaaat tgacagcact gattatgttt catcaggacc 240
 atctgttcgg aaccccagag cacgagtagt agtctcaaga gtaaagcttt ccagtttgaa 300
 tttagatgat cacgcaaaga agaaattaat taaacttgta ggagagcgat actgcaagac 360
 cacagatgtg cttaccatca aaacagatag gtgcccttta aggaggcaga attaccatta 420
 tgccagtgtg tctactaaca gtgttatatc atgagtcttg gaatactgaa gaatgggaaa 480
 aaagttagac tgaagccgac ttggagaatn tatatgggaa aatactatca gaaagaaata 540
 tctggnaacc cttttccgat gaaagtgtcg anaaaatntg gaattaataa gaagn 595

<210> 81
 <211> 601
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(601)
 <223> n = A,T,C or G

<400> 81
 acgcgggggga aaacaagatg gaggattcgg cctcggcctc gctgtcttct gcagccgcta 60
 ctggaacctc cacctcgact ccagcggccc cgacagcacg gaagcagctg gataaagaac 120

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aggttagaaa ggcagtggac gctctcttga cgcattgcaa gtccaggaaa aacaattatg 180
ggttgctttt gaatgagaat gaaagtttat ttttaatggt ggtattatgg aaaattccaa 240
gtaaagaact gagggtcaga ttgaccttgc ctcatagtat tcgatcagat tcagaagata 300
tctgtttatt tacgaaggat gaacccaatt caactcctga aaagacagaa cagttttata 360
gaaagctttt aaacaagcat ggaattaaaa ccgtttctca gattatctnc cttcaaactc 420
taaagaanga atataaatcc tatgaagccc aacttcgcnc ttctgagcag ttttgaattc 480
tttcttactg atgccagaat tangcngntc ttacccttac tcattgggag acattttctat 540
caaagaaaga aagttcagta tctgtaaacc ntttgtccaa gaatttttca ggagagatca 600
a 601

```

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<210> 82
<211> 606
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc_feature
<222> (1)...(606)
<223> n = A,T,C or G

```

```

<400> 82
cgaggtactt tgaatatgga gtagtttaca gctatttttt tttcttactg gtaatcttaa 60
ctaatatgat tcccttatta gagagcctct cactccccc cccccaataa tgtctactat 120
tcatgacagt aaccaattat tctggacaaa ttgcttcttt ttaatttgag ctatctgcca 180
tggaactttt aaaatggaaa cacagcctga gtgtatctta gggagagttt gattgaaaaa 240
atccaaatca ctatccatat agatcatgga tataaagaga tacctgattt ttattaaaaa 300
gatacttttt caaattttaag agttaatctt ggaaatttgg aacaagtaaa ggggcaagta 360
aaccttttga tgaaatataa aaggactcat tgcatagaat gactatcaaa ttctgngatg 420
tgnggcttct taaaaatatt ctacgggctt tggggggcctg ccanatggta cctgcccggc 480
ggccgtcaaa agggcgcaatt ccncacactg gggggcgtac taggggggtcc caacttggac 540
ccaacctggg gnaaataang gcataantgg tccnggggga aatggtnncc gttccattnc 600
cccann 606

```

```

<210> 83
<211> 613
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc_feature
<222> (1)...(613)
<223> n = A,T,C or G

```

```

<400> 83
gcgtgggtcg gccaggttac acgttcgtca tggcggctgg ccctggacct gggtaggggg 60
tccgggttca gtggtaatat cggcggagat gggggagcct ccgcttggtt tctttcacac 120
gggttgcttc ggaggaatcc gccgtgcaaa tctgtccgcc cccttgacca ctgatcccc 180
gaagagcttc tgtcgccgct ctaggaatac agacattgaa gtttgggaca agatatttat 240
ctaacttctg tgtcaaaatt agcgacctgc tatggcaatg aagaaagaaa ctgaatttgt 300
catttttcacc tgaagaaaaa tgatagacaa aaatcaaacc tgtggtgtag gacaggattc 360
tgtgccctat atgatttgct gattcacata ctggaagaat ggtttgggtg ggaacanttg 420
gaggactatt tgaattttgc aaactatctc ttgnggggtt tacaccacta atacttttaa 480
tacttcctta ctttactatc tttcttctct accttactaa taatttctta cacattatta 540

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agaagaaaga tgttttgaaa gaagcctact ntcataatta tnggatggtn caagggaaac 600
 anggcactnt ntg 613

<210> 84
 <211> 605
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(605)
 <223> n = A,T,C or G

<400> 84
 ggtactatct gctgctggca aatgggggtg ctctgggtga cagggatctg ctgacceaat 60
 gctatgggtt gttccagtca atgagttgag aaggctaaag ccttggttcc tatcattctt 120
 catcactaca ttggaccaca cattggcatt cagggcttgg acaattcgct ttactcctgt 180
 agattctggg aagtcacat cctcctcagg caactcctct ggactaagtt ctaccaattc 240
 aaagccatgt ttgaggcacc attccttgagc tttttgtcgg tttataccat cttcagacac 300
 tctatcgag accaagatca tcacctcagg taacctatgct tttgccagtg gaagccatga 360
 ggagacacta tcaaggcccg attttttgtg gctgtcaaag taaaccacaa atgcttggac 420
 agattctgca atctctgcag taaccagaaa tttgttgggc accccacata gattgagtct 480
 gctgaaaagt atttattatc aatggncccn ggataaaact acacattatt tggaagtact 540
 ttcncaataa gaacttntgg tccaaggtat ttttggaccn aanggnctct tgaaaaaacg 600
 gagga 605

<210> 85
 <211> 603
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(603)
 <223> n = A,T,C or G

<400> 85
 acagggaaatg aagactcgaa gaggagatgt cactttcctg gaagatgttt taaatgagat 60
 tcaattaagg atgctacaga acatggcttc aattaagaca actaaagaac tcaagaaccc 120
 acaagagact gcagagaggg tcgggctcgc agcactcatt attcaggact tcaaagggtt 180
 actcttatct gactacaagt tcagctggga tcgtgttttc cagagtcgag gggacacagg 240
 tagagtaaac tgcanagctg cctgtctgtg acttccaagg ctaggtcata aaaggagata 300
 aagctttctt tggtctgggtg ggctgcttgc tcttgaacct tcagtctatg cacgcaacat 360
 gcctttccag ccttctgtgg ttgtagagt natagaaagc aattggatca ctatngacag 420
 cggggtaaaa cttgaggaag caacctccgc caggnnggtac atggagganc cctgaannaa 480
 aggaanaaaa gggcacangg gcttaatcct gtcttggaaat gcttncctnt gcaatggnnn 540
 atttcaatgg ccnagccaat tatgccatcc ctgcnttaan accatgggcc ttcnttgnca 600
 ttn 603

<210> 86
 <211> 583
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(583)
 <223> n = A,T,C or G

<400> 86
 actgtaggta tttattaata atagcaatga agatgaaaga gtgatgtatc agagaggtgg 60
 agataaaatc agtaaaactt agacactaaa tgatagggga aggtggagga gaggaatgag 120
 cctagaaaac ttagaatata atggttctaa aattaaccaa agtaaggga acaggcatta 180
 gagtaggttt tgcagagaat gaatgtttta agacacacac aggtgtctct gggacaacca 240
 agaaaagtgc aacaggcaga tggattgagg agtctggcta aagataagga tttaggaact 300
 gctgaattaa aattacccaa gcgtgagaag tgggtgtgtg attaagagag aaaaaaaaaa 360
 tggaggtctg aggaatacct ttaanggatt aatgaanang cccaaagggtg gggggggtggt 420
 caggagtgc ccaaagttag aagtcaggga ataaacttta aagtnggggt gtcaaaatgc 480
 naatccgaaa aaaagtnagt nccttggccg gacccctag gcgaatccac ccctggngcc 540
 gtctanggat ccacttgnc aacttgggaa nntggctnct ttt 583

<210> 87
 <211> 332
 <212> DNA
 <213> Homo sapiens

<400> 87
 acgcgggggc attgctagaa gccggcagga gtgactctcg gcatggagga cccatctcct 60
 agcacacgtg cccactgaag tggcaccaac agaagtttg cttgaactaa aggacatttt 120
 atttttttta ctttagcaca taatttgat atttgaaaat aatataatatt attttaccta 180
 ttagattctg atttgatata caaaggacta agatattttc ttcttgaaga gacttttcga 240
 ttagtctctca tatattttat tactaaaata gagtgtttac catgaacagt gtgttgcttc 300
 agactattac aaagacaact ggggcaggtta cc 332

<210> 88
 <211> 592
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(592)
 <223> n = A,T,C or G

<400> 88
 cgaggtacgc ggggacaacc agctgactcc cgtagaggaa gacactgtgg aggccagttc 60
 tggagctatt gcagcctcgg ttgcccggcc cgggaccoga acccgaaaaa gttatcgtca 120
 gaatgtcggg caaagaccga attgaaatct tccctcgcg aatggcacag accatcatga 180
 aggctcgttt aaaggagca cagacaggtc gaaacctcct gaagaaaaaa tctgatgcct 240
 taactcttcg atttcgacag atcctaaaga agatnataga gactaaaatg ttgatgggcc 300
 aagtgatgag agaagctgcc ttttcactag ctgaagccaa gtccacagca ggtgacttca 360
 gcactacagg tattccaaat gtcaataaag cccagtgaa gattcnagn aagaaagata 420
 tgtacnagt gtactttgnc ngatattgaa cattccntga aggactgcng gtttttactg 480
 cttgggttaa cccaagtggg gacnnntgc ttaaattaaa gaggaatttt gcccaancnt 540
 gggacttctg gnggaattac ttttttgaa actttttggn accttgagn aa 592

<210> 89
 <211> 630
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(630)
 <223> n = A,T,C or G

<400> 89
 acgcgggggt ctttggggcg gcgcgaacca tggccggcat ggtggacttc caggatgagg 60
 agcaggtcaa gtcccttttg gagaacatgg aggtggagtg caactaccac tgctaccacg 120
 agaaggaccc ggacggttgc tatcggctgg tggactatct ggaagggatc cggaagaatt 180
 ttgatgaggc tgccaagggtg ttgaagttta actgtgaaga gaaccagcac agtgatagct 240
 gctacaaact gggggcctac tatgtgactg gaaaagggtg tctgacccaa gacctgaaag 300
 ctgccccagg tgctttttga tggcgtgtga gaaacctgga aagaaatcaa tagcancatg 360
 tcacaacgtt ggcctttctg cacatgatgg acagggtaat gaagatggcn acctgacttt 420
 ggaaaaggca aggactacta ccaaaggcct gngatggngg ntatctttca gtgcttnaaa 480
 cctaatgcat ttttcttcag ggggcccagg ctttccaagg acatggcctt gcctgtnaat 540
 cttcattaaa gccttgacct ggtcatatct ggccttgcca tgcaatccat ttacttggcc 600
 ggacacctan ggaatcacc actggggcgt 630

<210> 90
 <211> 653
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(653)
 <223> n = A,T,C or G

<400> 90
 ggtaccactt cactccagcc tggcgacaga gtggaactcc gtctcaaaaa ataaaataaa 60
 ataaaataaa gcaaaaatat aaaatgttaa aaaaaaaca aaaaaaggga aaaagggaagc 120
 tgattgcctt ggtgagtcaa cactgggtat tttctgacca ctatttgaaa caaaaaagga 180
 aaccactgat attctatgca aagatctgtt cctggaaggc actctgcgga gacaccagga 240
 gaacttttat caatccttca ttgatttgaa gtaaaagtgc taaagcaatg gttgggtgggt 300
 ggcaacccat tagcagatca caaaatcact gtagtgggta actaaacaag aggaaacaca 360
 agacggcatc ctgtgtaact ggggttaagc attactctct gaaactcatg gcatcagttt 420
 cctcttaggc tcttcccaca aagtataatc atgttcattt cagttttacaa tcccttgag 480
 tcccatcgat ttgtgagaat atcccaagtc atncacagng gagnctggaa atgggtentan 540
 ttgtcctgcc cggcngccgt tcnaanggcg aattcaacac actggcngcc gttctaatgg 600
 atccaactcg naccaacctg gnggaacatg gctactgggt ctgngnaaaa tgn 653

<210> 91
 <211> 657
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature

<222> (1)...(657)

<223> n = A,T,C or G

<400> 91

actttttttt	ttttttttt	ttttttttt	ggagaaaagc	ctnactccgt	tgcccacgtt	60
ggagtgcagt	ggcgtggnc	tagcttattg	catgcagcct	naacctccca	ggctnaagca	120
atnctccnac	ctnnncgtgc	tgnnttnntg	gaactacnca	tncacnchnat	tatgcccanc	180
tngtngttgt	naatttaaag	tganaccatg	cncncagggn	gnatggcntt	nnntancnan	240
catgcattgt	cagctgtgta	gtgcacgcac	aggataaatg	gaagggggat	ttgatcaggg	300
tttttgtcac	atnagcattn	naaatccgna	ngactgccnt	gtgtctgcct	ttgnaagggc	360
ctgggagtat	tctgtgtagc	ctttgnaaat	aagggnaaaa	tgngcncctg	ccaaaagaagt	420
cnttgctact	ntgggtgngt	caaaatntcc	ctgtaacttg	tcaatggnc	caagcttggn	480
ggngtntttg	ggntcttggn	tgtcnttttn	acgtctattg	nccatgtggt	tcctatatga	540
cacantcttc	ntnataatcc	ntganaattg	ctaanttgc	cttttttttt	tttttnanatt	600
nattttgctn	ttaaantagc	ttaanncttt	ntttatcctn	gggcancnca	anncaat	657

<210> 92

<211> 653

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(653)

<223> n = A,T,C or G

<400> 92

accataaaac	cattaaaagc	aataaataac	tagagtcatg	tgagatgttt	caaagactgc	60
tggagggttt	tgtaaaccag	ggtaatcaga	aatattaccc	ttgtagatag	ccctctcata	120
ccagtaaaata	caaagagtta	aaattccaat	gccacagtgt	aacagttaac	aatctatttt	180
gtaattttta	atattactac	attaattcac	cctgagaata	cagaggaaac	atttaataca	240
agacattctg	atatgntttt	ttttcccat	gnatttgctt	tcttctggnt	ttcatcagcc	300
ctttaagggc	acagatatatt	taatttaaag	ggtgatttgg	atatgctttt	ttggtaactg	360
agatttatgc	cacagtcaga	tactggtgat	agaaaagccc	aaaaaggntt	gnagaaaaga	420
ggcaagcagc	aatccccagg	cagaaaagac	ngaaagtctt	gaaaaagaag	aggagtataa	480
atttttttta	gctgntcaat	gccctgtatt	tgggnacaag	tacctttatt	ttccttttagc	540
tganggnant	cagagtaacc	gaattggng	nnnactatatt	tcnctggnaa	ggaaaataga	600
atttggnaat	cccnggaang	gtncctngaaa	tnnagcccca	tccatttggn	gng	653

<210> 93

<211> 640

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(640)

<223> n = A,T,C or G

<400> 93

acagagaaac	cacaggttgc	cctttccaca	gctggataga	cttatccaaa	acggcaggat	60
ggttctgtat	taatcttttt	ggaaagcatg	tctgtattaa	gattgcaaaa	catacagata	120
gctaccacaa	attaggtcaa	acgactgatc	aagttgtaac	atctgtgagg	tcaaattcca	180

aagtgcctag	atacacattt	atacaacaga	ccataagagc	tgaattcttt	acaaatgtct	240
ttatgggcat	gtaaaattga	ctctgcattt	ctgcatgtgt	gcattccata	agagagacca	300
gtctgcactg	agtcataatat	actccaactt	gaaaaagtaa	gtgnaacaac	tggntaatca	360
tgcaagtctg	gttgnaatat	aacaatgact	ggnaaaacat	gaattcttcg	cacagtagta	420
ataggngcac	tnatttataaa	ccctnccgaa	aaacctgnat	ttgggtgcaan	atctganttt	480
aagnggtagt	aacttgacnt	ttaaaaatag	tttgaacnat	ttanaaaaggn	aagccaactt	540
ttacttataaa	gaatcccaag	tggnaaaaanc	tggntttcaa	tggaatgaac	tnggtgngac	600
ctnccctaata	nngaccttga	gcctatnagc	taatntangg			640

<210> 94
 <211> 658
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(658)
 <223> n = A,T,C or G

<400> 94						
acgcggggcca	agctttttttt	ttaatttggt	gttttctccc	atcctttccc	tttaaccctc	60
agtatcaagc	acaaaaattg	atggactgat	aaaagaacta	tcttagaact	cagaagaaga	120
aagaatcaaa	ttcataggat	aagtcaatac	cttaatgggtg	gtagagcctt	tacctgtagc	180
ttgaaagggg	aaagattgga	ggtaagagag	aaaatgaaag	aacacctctg	ggctcttctg	240
tccagttttc	aagcactagt	cttactcagc	tatccattat	agttttgccc	ttaaagaaagt	300
catgattaac	ttatgaaaaa	attatttggtg	gacaggaatg	tgataccttc	cttggntttt	360
ttttgcaanc	ctcaaatcct	aacttctctg	cccacaatgg	tgagcaggtt	cccttgatac	420
ttcttttctt	taatgattta	actatnaact	tnataaata	acttataggg	gatagggaaa	480
attcctgaat	tccagaatgc	catctgntaa	aaaagaatnn	aaatgggaag	tnggactnaa	540
aaggagccaa	cagcatgctg	cggtggnnng	cacttctttg	cnctatccca	ggaaggaagg	600
tccccatttg	gaaagggggt	cttnctcact	ggnaccggtt	tgacntnatt	ggnacncc	658

<210> 95
 <211> 392
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(392)
 <223> n = A,T,C or G

<400> 95						
actcagactt	gatcgattaa	tgaagtgggt	atthttggcct	ttgcttgata	ttatcaactc	60
actggtaaca	acagtattca	tgctcatcgt	atctgtgttg	gcactgatac	cagaaaccac	120
aacattgaca	gttggtggag	gggtgtttgc	acttggtgaca	gcagtatgct	gtcttgccga	180
cggggccctt	atttaccgga	agcttctgtt	caatcccagc	ggctcttacc	agaaaaagcc	240
tgtgcatgaa	aaaaaaagaa	gttttgtaat	tttatattac	ttnttaagtt	tgatactaag	300
tattaaacat	atttctgnat	tcttccaaaa	aaaanaaant	aatnaantta	naanccttta	360
aanatanaaa	taaaataata	angaccattg	ag			392

<210> 96
 <211> 655

<212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(655)
 <223> n = A,T,C or G

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<400> 96
ggtacaggtt tttatgtgaa catacatttt cattttctgg gataaatgct caaaagggca      60
actgttgggt tgtatggtaa acacatatat ttttgtaaga aactacccta ctctttttcc      120
agagtggctc tactttttac atacagccac tcatacaatt cagacagcaa tgtatgattg      180
atccagtttc ttcacatcct caccagcatt tgggtattact actatttttt atcttaacca      240
ttcacataga tgtgtgtaat gataccacat gtgggtttta tttgcatttc caatggctaa      300
tgatgttgag tatctttttg tgtgctaatt tgccatctat gtatcctctt cggtgaaatg      360
tcttcatgtc ttttgnctat tttctattta agncatttgg tctttttact attgagtttg      420
agaggggttt tatatatcct agataaaaaat cctctgggtan anatgtgggt gcctggaatt      480
ttaacataac ttctaccan ggaaaaataag taaaatttcc acccttgctg gcnagcctta      540
cttaatnccg gccttaangg tccttctaga gaattaagaa gatttgaggt ttaaatanaa      600
tcagggcntt aaaaagtaat cctaaaatcn ggtttaagca agccatatcc tgggg      655
  
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<210> 97
 <211> 224
 <212> DNA
 <213> Homo sapiens

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<400> 97
acaagtttta ggtaggacgc agcattttat agtgttacgt ccttcctccc cacattcctg      60
tgaggcgga caagaacaat tacttgaccc tggaggaaga cgacgccttg tggtcagga      120
gagaacagca gttcatgctg gctgcctcgt ctttcaggc ctgctgctgc ccaggcttct      180
actgaccttg ttaggtctga ttctagaaaa tgaaggcagg tacc      224
  
```

<210> 98
 <211> 582
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(582)
 <223> n = A,T,C or G

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<400> 98
ggtaccacca tgcctgggtt attgttttat ttttttggca gagatgggtc tcaactgtgtt      60
gcccaggctg atctcaaact cctggcctca agcgatcctc ccactcagc ctcccaaagt      120
gctgggatta cagacctgag ccaccacacc tgggcaacag agtgaaacct gtccctgttt      180
tctgtctctt actctcacct ctgaggcctc ctctgcctgg aagagattac agggaaattc      240
caggcagccc ttgtcaattg tttttatgaa ttctttacct gttcctttta aagacaagga      300
aactgaggcc caaagtctta agttgtttgg caaatggagt ctccctaccct cagctcctgc      360
aaggacctgg gggaccccca ggtccagcag ccacatgatt ctgcacagac agggacctag      420
agcacatctg gattttaagc caccctggca actggctgct agagactncc aagatgccga      480
taataggatc tgccnttaaa aaatctggat tctggcctgc ntaantgcta cttcatttgg      540
ctacaaagnt ttaaggngga accnttaaaa ccttccccaa aa      582
  
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<210> 99
 <211> 619
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(619)
 <223> n = A,T,C or G

<400> 99
 ggtacagtgg tccttttcag agttggactt ctagactcac ctgttctcac tccctgtttt 60
 aattcaaccc agccatgcaa tgccaaataa tagaattgct ccctaccagc tgaacaggga 120
 ggagtctgtg cagtttctga cacttggtgt tgaacatggc taaatacaat gggatcgcgt 180
 gagactaagt tgtagaaatt aacaaatgtg ctgcttggtt aaaatggcta cactcatctg 240
 actcattctt tattctattt tagttgggtt gtatcttgcc taagggtgct agtccaactc 300
 ttggtattac cctcctaata gtcatactag tagtcatact ccctgggtgta gtgtattctc 360
 taaaagcttt aaatgtctgc atgcagccag ccatacaata gtgaatgggc tctctttggc 420
 tggaattaca aaactcagag aaaatgtgcc catcangaga acatcataac ccatggaagg 480
 atnaaagccc caaatggngg naactgataa tagccctaata ggctttaaga atttgggcac 540
 actnttacct agngaaccc atttgancn anggggctta aaggcttntt acttcaactg 600
 aaagttnagg gaaaaaaan 619

<210> 100
 <211> 614
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(614)
 <223> n = A,T,C or G

<400> 100
 acgcggggga agcaaaggag agggaagctg gaagcacctt tggcccggga cagaaatctg 60
 gagagcttgg ctacctccat cctcctcagg ccggagcagg ctctctgaga gagtccaggt 120
 cgtaggagtt ttacgactta gaaaagcggg ctgcagattc ctctctgggt gtttggttca 180
 agccctggct ccagcctcac tctcagtctt cccgggaggt cgtgggattt ggaccttaga 240
 ttattagtat tattttgagg gctcctctgt tgtaagcact gggtgtgctg agatggctgt 300
 gcagagggcc atgaggtaga ggctggggaa atgagggctt ggaggtgctt gaggtatggt 360
 ctttacctac gtgaaatgtt ggaggttgag atgaaaactc ttgctttgaa atcttcatgg 420
 aggactacat catttcaatc ctgaatctgg ctcaattcta ttaatcactt aatacctgga 480
 ttaaaaaacg nttaantggg ccaggcncaa tgggtcacgc ctgnaatccc agccttttgg 540
 gaggccaaag cangccggat acnttagggc ngnanttnaa accancttgg caaatggga 600
 aaccgcntt tntn 614

<210> 101
 <211> 625
 <212> DNA
 <213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(625)

<223> n = A,T,C or G

<400> 101

ggtactttgc	ctacggcagc	aacctgctga	cagagaggat	ccacctccga	aaccctcgg	60
cggcgttctt	ctgtgtggcc	cgctgcagg	caagaagggg	ttaaaagtgg	aatgtatgtt	120
gtaatagaag	ttaaagtgtc	gactcaagaa	ggaaaagaaa	taacctgtcg	aagttatctg	180
atgacaaatt	acgaaagtgc	tccennatcc	ccacagtata	aaaagattat	ttgcatgggt	240
gcaaaagaaa	atggtttgcc	gntggagtat	caagagaagt	taaaagcaat	agaaccaaatt	300
gactatacag	gaaaggtctc	agaagaaatt	gaaagacatc	atcaaaaagg	ggnaaacaca	360
aactcttttag	aaccatanen	gaatataatc	taagggtatt	cctatgtgcc	taatataata	420
tatttttaac	acttgagaac	cagggatttt	gggggattct	ccaacgtttg	ttcaatttta	480
agaantgggt	tgaaggagtt	tttacttgg	gtnattcntg	gttttaggat	tttnnanngn	540
aanntggntt	nggngtttgn	nnttttaann	gggntntttt	ngggtcttna	aatttttcca	600
anaaanngtn	gnttccttcc	cggnn				625

<210> 102

<211> 605

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(605)

<223> n = A,T,C or G

<400> 102

ggtacaagaa	agaaaaaata	taaaaacaag	tctgctgagt	gtcggggagt	ggtgagggat	60
atcctaccat	attgtgacgg	agtccaaata	gaaaacatgc	agcaacagtt	ctcctgcttt	120
atcagctccc	tggaaaataa	accagtaacc	ctggtagtgc	agtaaccatt	tggttaacag	180
gacaaacttc	ctgatggaca	cagatagtaa	ttcactgcat	ttcccttctc	taacttctct	240
cttcacacca	attccttttc	tttcctttta	gatgggtttc	atcctgttga	caaaagattt	300
ggtttttatt	gtaaagtaaa	gcagataata	tcctgattga	agtattcaat	gatttaattg	360
aggatgcttg	gggatcaaac	tttgtaaaaa	ggtcaattaa	gctagttagc	agagactatc	420
agtggcttgc	agaaaaaaaa	ntcngatata	tggtttggtg	aaangcccaa	aggataaccg	480
ngaaaaatcc	tanggatacc	gggacctaatt	taatcaaagc	canagggggg	ccttggttaa	540
ancnttact	tngggggagg	gctnaanggn	ggntccaaac	naaattgggt	cccaacgggc	600
ccggg						605

<210> 103

<211> 251

<212> DNA

<213> Homo sapiens

<400> 103

acgcgggatt	ttacattcca	tcttttctga	agattgtcct	acaatttgga	ttttgatcat	60
gacaaagaag	attaaaaatt	cattagcatg	aatgcaattt	gttaaagcag	actgatttgt	120
ttctaagata	tttttggttt	ttttaaaact	gataataatg	ctgaattatc	ttaatgtaga	180
tgtaaagccc	actttgttct	tttaattgtaa	tggagcttat	gggtagaaga	ccatgtctac	240
taattacaaa	a					251

<210> 104

<211> 293
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(293)
 <223> n = A,T,C or G

<400> 104
 ttaatcttgc acaaattggca ttttattaaa gaaaatctaa tttacaaagc tttgtaaatt 60
 ttaagaaaaa cattcataga tcataaacia aaatttcaat atgcaatatt caaattttaca 120
 agaaaataag cacaaacttt tagacagtgc agttattgct gcactccttt aattccttat 180
 ccagagccca aaaaatgtag acaaacccta aaaatgtagc agaagcattt ccgcacactg 240
 gtgtccagaa tctagtttgc gcanaaatgt ttccactaga tttatagagt acc 293

<210> 105
 <211> 586
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(586)
 <223> n = A,T,C or G

<400> 105
 acatcatttc tgccatgtgg gacattttct tgggaatata caagtaatac tccatgtagc 60
 ctgacaggtc ctcaatgggc acatcatcca cgaagactcg agcttgctca gaacaggatc 120
 ggggagagcc agacagagtt ctggcggtgca gcgactgaga gtagtcctca agtgtggatc 180
 ttcgttctgg agccaaggga gggacactct gcgggcctga aaaggaatac acttccatat 240
 catgccatct cttacactgg cattccttgc ctatgcatgt gcattggcttg ccttgggtta 300
 gcttggaaac tgattgaaag tcagagagat cactggcttt gagacttgct tgggggactt 360
 gggtagccgt cagaggagtc ttccttctta ctctctgatg ggagccttgg aacagaaaagt 420
 tctcaaangc tnaacgactg gccctggggt gaatagcacg gagagaagta naccttcttc 480
 ctgnactgaa ctnttaaggg gatgaaatcc ccagccaatg gtggccttan gnnangcaan 540
 ntggcctttg gcttgaatta ctggntggaa aaaacctttg gccttt 586

<210> 106
 <211> 644
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(644)
 <223> n = A,T,C or G

<400> 106
 ggtacnttga ttgctcanat ataangaaat ggcccaatga acgtggntgn gggagggggaa 60
 anangaaaca gagctagnca tatgtgaatt gntctgtggn ataaacatgt taaaacanac 120
 aaanatggnt atttttcttt ncctccggac agtgcacatt atcatntgaa ctacctgggg 180
 attctntatc anaactgggc ttgttgaata tttatactta attgaaataa ttccttanng 240

gaggcntggt	taaaacgtat	taacaggana	ttgtgtnntna	nacattttaat	gaaanacgaa	300
attccacnag	aatganntaa	gtcactttcc	aagtgggtgt	catttttgta	aaccctngtt	360
tacctgtttt	gctattntta	centttcatt	tgggaangtg	ntttgagntc	gtanttacca	420
gggnaaagac	gggttncttc	ctngctgnnn	cttnagccnn	tgctaaaaag	cnttaatttt	480
ntgcnattng	gnncttcttg	ctggtaatcn	tggaaaaant	gggnnaantc	cagctttntt	540
tnttggcngc	ccaaaaangg	attcnnantn	gnnannnaac	ctttgggtcc	ntaannaana	600
aaangtatnc	anaangaacc	ttgncatgcc	ngccnntnta	aang		644

<210> 107
 <211> 618
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(618)
 <223> n = A,T,C or G

<400> 107						
ggtacagact	tgccctttga	aatctatacc	tctggataca	ttagaggcat	tttattaaca	60
aaggcccttc	taaatgtgct	atattattga	caataactat	cagatttgcc	tttaattttgt	120
gtttatagca	tttatcaaaa	cgtatcctca	tagactttat	gcagattaat	atggtcaatt	180
gatttggata	aaagaaagta	atttcagggg	ttgtttttta	gccaggacaa	gaagtgcata	240
tgctctcttg	aagcaattta	ggctaaactg	attttgaaat	ttcaaaatgt	tttattttac	300
tttgttttat	taagccagga	caagaagtgc	aaatgccctc	ttttgaagca	attcaggcta	360
ggtaaaccgg	attttgacca	tttcaaaacc	gtttaattta	ctttgggtta	atatcagagt	420
cttataaaa	tgntgncaaa	aatttctgaa	ggctttngaa	aagggttggt	agtggaccct	480
gcccggcgcg	ccgntcnaag	gcgaattcag	ccactggcgg	ncgtactagg	gatnccactc	540
ggacccanct	tggcggaatc	atgggcataa	ctggttcctg	ngtgaaatgg	gatccggttac	600
aattcccaca	acatanng					618

<210> 108
 <211> 620
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(620)
 <223> n = A,T,C or G

<400> 108						
ggtaccaaaag	gagaattttg	agagctggct	aaattattttg	aagaaagaat	tgccaacagt	60
ggtgttcaga	gcctcaacaa	aaccaaagga	taaaggggaag	ataaccaagc	gtgtgaaggc	120
aaagaagaat	gctgctccat	tcagaagtga	agtctgcttt	gggaaagagg	gcctttggaa	180
acttcttgga	ggttttcagg	aaacttgtag	caaagccatt	cgggttgagg	taattgggtt	240
cccaaagtgt	gggaaaagca	gcattatcaa	tagcttaaaa	caagaacaga	tgtgtaattgt	300
tggtgtatcc	atggggctta	caaggagcat	gcaagttgtc	ccctttggac	aaacagatca	360
caatcataga	tagccccgac	cttcacatgaa	tctncaactta	attccttctt	tgngccttgn	420
ttttgcnaag	ttcanccaag	gttttggaagt	antaaaancc	gatggaagct	tgccantgcc	480
atcctttcca	agcttgatgc	ttgacaggta	gtancttgnc	cgggcccggcc	gttcnaaagg	540
gcgaattcaa	cacactggcn	gccgtactat	ggatccgagc	ttggnccaaa	cttgcgtaat	600
catggcatnc	tggttcctgg					620

<210> 109
 <211> 317
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(317)
 <223> n = A,T,C or G

<400> 109
 tttgtatatt tagtagaggc agtggtttcac cgtgttagcc aggatggctc cgatctcctg 60
 acctcgtgat ccacccacct cgacctccca aagtgctggg attacaggcg tgagccacca 120
 cgcccggcct cttttttttt tagctgcca tctttttgaa ggaatattct tacctctact 180
 ttgtcacctt ctactggctc cttaactaaa atctgccatt tggctctctg gttaacagtc 240
 ccttcctgta aagtctaaaa tcttaattct aaatccacag ttaattcac aagctagtag 300
 cttggccgng accacgc 317

<210> 110
 <211> 603
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(603)
 <223> n = A,T,C or G

<400> 110
 ggtacattca ggatccctcg gccaggact ggaccagaag aacacttggg aatcttgggt 60
 ccacttatca aaggtgaagt tggatgatc ctgactgtgg tattcaagaa taatgccagc 120
 cgcccctact ctgtgcatgc tcatggagt ctagaatcta ctactgtctg gccactggct 180
 gctgagcctg gtgagggtgt cacttatcag tggaaacatc cagagaggctc tggccctggg 240
 cccaatgact ctgcttgtgt ttcttgatc tattattctg cagtggatcc catcaaggac 300
 atgtatagt gcctgggtgg gcccttggct atctgccaaa agggcatcct ggaaccccat 360
 ggaagaccga gtgacctgga tcnggaattt gcattgggtg tcctgaattt tgatgaaaat 420
 aancctggna tttggaagga aatgtgcaac catgggtcca agaatccagc cnnattaacc 480
 taccggatga acctttnttg gaaaccataa aatgcctgca atcaatggga actttttcca 540
 accttanggg cttaccatga ccttgcccgg ccggccnttt aaanggccaa ttccaccccc 600
 tgg 603

<210> 111
 <211> 595
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(595)
 <223> n = A,T,C or G

<400> 111

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acattttaagt tcccatgtta cagaatccca tattgtgact atttcctcaa aactaactgc      60
tagtaaagaa ccattcttcgg agaaacaaca gttagttgct tgatacttgt gataactacc    120
aacaaagtca caggtccagc caacagcttt tttgtatatg tcagagtcac ctgttaatat    180
ccatactttg aagtaaccat ctttgctagc tgtaaccaag gtgggctgtt cagatttttc    240
tgcattacag aaacagagag ctgtaatgca gtcttcgtgt ggcattgttaa ttttagtggt    300
aagaataaac ccttggtgtt tcttattata catccacagt ttcatttgca attcaagctc    360
aagtttcctt ttcttgccgc tggccactg gtgcaagcca gttaccaaag cagccaatgc    420
aagccttggt aagtcaattt ggatcaganc ataatacanta atatatcctg ctggataata    480
ctaaattgga tactggntat cactntggag agaataaact gcaggtggcn ggntttcatt    540
caaaccaagc tttagtcttg gacaatcatn aaccagnгаа atactcctat ntttn      595

```

<210> 112

<211> 523

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(523)

<223> n = A,T,C or G

<400> 112

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acaagagcta ttagagatgc tgccatatgg atgggcaaaa ctgagccaat ccacttagg      60
aatggaaggc ttggacatgg aaggagggat ataaacgagg agttggagaa aaacgcaagc    120
ccagtttttg cttagagtga aatgaaagtg ggaatgaggg tcttggtttt agtcctctaa    180
ggaccaggaa gcaattttta aacttccttg gtttttctga aagcagcata ttcaaaatgc    240
cagcaaaaac tcctaacaac tgcaaaacca aaagaggatc aaagctcacc aacatccctt    300
cttattgctg aaaggctcta aaattcagga tgcctgttcc ctttgtaaaa gggaaaataa    360
ttaaagtctg atttatggta atcataccac atcacacttc taaaaaataa tttcaagtgt    420
gtgaccaggg gaccgtttga ccnccatttt attaaccttc actttantgg gaaaaataaa    480
accttttcca gggccatttn atnccaggac ttttagtagg ggg                        523

```

<210> 113

<211> 578

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(578)

<223> n = A,T,C or G

<400> 113

```

acagtgtaaa taactaagtt gttaactgtc aagtcagtt atgtattctg taagttgtgt      60
tctagtcttt gactaaaatt tatcatctct tataatggga cttaatcttt ctctaaaagc    120
atataagagc ttgtcaatag agcaatcaat caaaaagatt ttgtgattca taacattgaa    180
gttagtctgg ttaagagttt tgggttagac ttcatttata ttttccttac taatatctaa    240
tatttaatatg ataatgatca attttttata aagttattaa tatgatcagg gaaacctttg    300
ggacttctga caggcatctg gtgaagagac aattcaagcc ttagtgacta tttagaatag    360
ccagtgatca ctagttaatt ctcatatcca tgcctttttt gccctgggta cagtcttaaa    420
agaggtaaaa cagcaaatat tttttttaag ggaactataa ccctangaat tcctgaaaag    480
aatttcaaaa aaaataagac cctgtggcca tggngnccaa acntaagacc tactatggct    540
atattggtcc attaaaaata aattactact aatccaaa

```

578

<210> 114
 <211> 613
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(613)
 <223> n = A,T,C or G

<400> 114
 acggtagtaa gaaacaccttg agatctttct gacttttcaa aattagagaa agcaaattggg 60
 atggatagat tttttttttc ttttcaaggg gggcaggaag gtaatgggtt gagtagcctt 120
 tgttttaaaaa aaaactaaat atattttaaa ggccacattt atattttttt cacaagaacc 180
 acataataaa ttccacttct tgacctgaat ttggaaatcc gaaattacta atccaggcca 240
 ggtgtggtgg ctcatgcctg taatcccagc actttgagag gccgaggtgg gcagatcact 300
 tgaggcctgg agttcaagac caccttggcg aacacgggtga aaccccgtct ctacgaaaaa 360
 aaaaanatat aaaaaaagta ctggttatta accaaccagc ttagaaaaat aatcatggtn 420
 gacacnttan ttcattcttc taaaagcctg ttgatctggg ccttcctgtt gccagcattt 480
 cccctttttc aaaaatgggg ggccttttct ttaattnnac ctctgtggngn aananaattt 540
 gaagggcccc aggaagtnt ttgggcncct tgaagcggtt tncacncgtn tagattctnt 600
 gattaaatcc tcc 613

<210> 115
 <211> 190
 <212> DNA
 <213> Homo sapiens

<400> 115
 ggtacattgc cactgagtaa agagtggcac cagccacggt ggtaggtgga agaaacatag 60
 atcccaatga ggacacaaaag acgagaccca ggcccactcc caggggtgca cccatgttca 120
 gaaacttttc actgggcgca cacatggcca cagtggagag gcctcccaca atgccagctg 180
 tgtacttttt 190

<210> 116
 <211> 610
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(610)
 <223> n = A,T,C or G

<400> 116
 ggtactcttg gtttatcaat gggacgttcc agcaatccac acaagagctc tttatcccca 60
 acatcactgt gaataatagc ggatcctata tgtgccaaag ccataactca gccactggcc 120
 tcaataggac cacagtcacg atgatcacag tctctggaag tgctcctgtc ctctcagctg 180
 tggccaccgt cggcatcacg attggagtgc tggccagggg ggctctgata tagcagccct 240
 ggtgtatttt cgatatttca ggaagactgg cagattggac cagaccctga attcttctag 300
 ctctncaat cccattttat cccatgggac cactaaaaac aaggtctgct ctgctcctga 360
 gccctatatg ctggagatgg acaactcaat gaaaatttaa agggaaaacc cttangcctg 420

aaggtgtgtg	ccacttcaga	gactttacct	taacttgaga	cngntcaaac	ttgcaaacca	480
tggngnggaa	atttgccgaa	ctttacactt	tgggcagggt	ttttcccaga	agtcanaaca	540
agaactcctn	ntcttganaa	gggttttanc	ccctttnaat	ggccttgctt	atgctgcctt	600
tttcgtttgg						610

<210> 117
 <211> 608
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(608)
 <223> n = A,T,C or G

<400> 117						
ggtacgcggg	gggtattatt	tgtgccaaacc	aatgatgctt	ttaaggggaat	gactagtga	60
gaaaaagaaa	ttctgatacg	ggacaaaaat	gctcttcaaa	acatcattct	ttatcacctg	120
acaccaggag	ttttcatttg	aaaaggattt	gaacctgggt	ttactaacat	tttaaagacc	180
acacaaggaa	gcaaaatctt	tctgaaagaa	gtaaatgata	cacttctggt	gaatgaattg	240
aatcaaaaag	aatctgacat	catgacaaca	aatgggtgt	ttcatgttgt	agataaaactc	300
ctctatccag	cagacacacc	tggttgaaat	gatcaactgc	tggaaatact	taataaatta	360
atcaaatcat	ccaaattaag	tttgttcgtg	gtagcacctt	caaagaaaat	ccccgtgact	420
gctatagacc	cacactaacc	aaagggtcaa	attgaaagggt	gacctgaatt	cagactggat	480
taaagaaagg	tgaaaccatt	actgaaagtg	gatncatggg	gaagccattt	tttaaaaaat	540
ncccaaaanc	attgatggga	attccttnng	gaaataactg	aaaggaaccn	nnnnagacca	600
atcnttcc						608

<210> 118
 <211> 578
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(578)
 <223> n = A,T,C or G

<400> 118						
actccactta	gcaaatgccc	tgccagcaaa	gtcacagatg	actttttttac	ccaatcttag	60
gtaaatctgg	attatctgcc	caaccgtgca	agtcaataag	ccacccttga	aaactgtgtc	120
aagatttgag	gaaacaggtc	ttaagaacct	atccaacaca	tgattccata	accaatacat	180
cttangttgt	tttaggcaaa	taggtgtatc	tcttgaatca	ctgatggatt	caatatcaag	240
atctataatt	ttcacgttta	aaatttactc	tgccgaggac	atttttattg	taaagcataa	300
accagttagt	ttgacagaca	cnaaaaagaa	aacnaaatgt	tcacagtcct	atcttcgtag	360
ggattcttgg	ctataaaaaat	tggcttcagg	ttcaaggctc	tagaccactc	ttctaaggct	420
nctactggat	atantantta	ccacttgggg	nccaaactta	aaacctcntg	gactttttcc	480
ccttanggac	nangaaaaac	caaggggttg	tggtttgaac	tcctacact	tggngnnaaa	540
ncctttcttg	gnngnatnta	aanattaagg	ggcttttn			578

<210> 119
 <211> 584
 <212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(584)

<223> n = A,T,C or G

<400> 119

actgtcttag	aatattat	ttttttt	gt	atttgtaa	at	ctgtggaca	aagagggtt	60
cctcactcct	tttactcact	gggctcatga	cagtgaagga	gatgctccat	ctgcttctcc			120
ccctttctct	tgtgtagtc	caatgtgcta	tgagcatcag	cttactttgc	cacttagagc			180
aagcaaaacc	cagtgaaga	gtctcgttca	gctctaaata	ggtttgctt	cttttagtta			240
cagtgcccat	tttgaaattg	cctatacagt	cttagtgacc	atttaaaccg	gacgaactan			300
gcgtttaatt	ttcacttctt	catgttnaat	tngcagttca	anatttatag	naagatggnt			360
atttcgaaaa	nacaaaaaan	tggnttttta	anaaaanaag	tncnttggtc	ggcgaancan			420
gcntaagggg	cgaatttcca	gcncactgg	gcngggcccg	nncntagnng	atccccaacc			480
tttggtaccc	angcttnggc	nntaancaat	tggncanag	nttgtttccc	tggggtgaaa			540
antngtnatc	ccgttcccaa	ttcccnaca	ncnnaccnng	cccg				584

<210> 120

<211> 587

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(587)

<223> n = A,T,C or G

<400> 120

acgcgggggc	cgtagcagcc	gccgcccac	cctctttgtg	tgctttggaa	agccgcggag	60
ctgggtggtg	ctacagttgg	tggtgggggc	ttaggcgagg	gacgttaccg	ggaagttgca	120
ggcgggagga	ctcttcccca	tccagtcacc	tgacaggtca	caaacatgtc	agacaaaaag	180
gaattaaagg	ctgagttgga	acgtaagaag	cagcgactgg	cccaaatcag	agaggaaaag	240
aagagaaaag	aagangaagg	gaaaaaaaaa	gaaacagacc	anaataagga	agctgttgct	300
cctgtgcaag	aagaatcaga	tctttgaaaa	aaaaaggaga	gaagctnaaa	gcattttgctt	360
caaagcatgg	ggctaacttc	agaaatcccc	ccattgggnc	ttcctnctaa	tncttncatn	420
ccttcaaaat	ctgtggagcc	ctttccaagg	tgaaacttgn	aannccaaga	antntggaaa	480
atggcncct	tggggaatct	agaccnaggg	nccttttttna	accttggaat	ngnttaaaaa	540
tcacnccaag	nttgactttt	ccttccttcg	anaaaattgg	gtcccn		587

<210> 121

<211> 570

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(570)

<223> n = A,T,C or G

<400> 121

gggtactcttg	gtttatcaat	gggacgttcc	agcaatccac	acaagagctc	tttatcccca	60
-------------	------------	------------	------------	------------	------------	----

acatcactgt	gaataatagc	ggatcctata	tgtgccaaagc	ccataactca	gccactggcc	120
tcaataggac	cacagtcacg	atgatcacag	tctctggaag	tgctcctgtc	ctctcagctg	180
tggccaccgt	cggcatcacg	attggagtgc	tggccagggt	ggctctgata	tagcagccct	240
ggtgtatttt	cgatatttca	ggaagactgg	cagattggac	cagaccctga	attcttctag	300
ctcctncaat	cccattttat	cccatggaac	cactaanaac	aaggctctgt	ctgcttctga	360
agnccatat	gctggagatg	gacaacttaa	tgaaanattt	aaanggggaa	aacccttaag	420
ccttgagggtg	tgtgnccact	tcanaggact	ttaaccttaa	ctttgagacc	aggtcaacct	480
ggnaancct	tgggtggagaa	attggccgaa	cttcccnact	ttggccagg	tttccccang	540
antgtcaaan	caagacttcc	ttatcatgnn				570

<210> 122

<211> 551

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(551)

<223> n = A,T,C or G

<400> 122

actatctcta	ttcaggatta	tgaagttttt	cgatgcgaag	attcactgga	tgaaagaaag	60
ataaaagggg	tcattgagct	caggaagagc	ttactgtctg	ccttgagaac	ttatgaacca	120
tatggatccc	tggttcaaca	aatacgaatt	ctgctgctgg	gtccaattgg	agctgggaag	180
tccagctttt	tcaactcagt	gaggctctgt	ttccaagggc	atgtaacgca	tcaggctttg	240
gtgggcacta	atacaactgg	gatatctgag	aagtatagga	catactctat	tagagacggg	300
aaagatggca	aatacctgcc	cgtttattct	gtgtgactca	ctggggctga	gtgagaaaga	360
aggcggnctg	tgcagggatg	acatattcta	tatctttgac	ggtaaccatt	cgtgatagat	420
nccagtttaa	ttcccatgga	atcaaataca	attaaatcat	catgactacc	ttgggtcccc	480
atcggttgaa	gggacngnat	tcattggggg	ggcattggat	ttgatnnena	gnntttattca	540
atactttctc	n					551

<210> 123

<211> 575

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(575)

<223> n = A,T,C or G

<400> 123

acttaataca	tattttcaaa	cctgtttgca	tttcaaacaa	agttagcggt	tttgtaaate	60
aaatttgata	acccgactaa	aaatattttc	cagctttatt	atttaaggag	ctgcacagcc	120
tttaaagtgg	ggaccaggag	gcaggcagag	gcagagagac	tgaatgcacc	caggactgcg	180
cagcagtcta	cagcaacatg	tcccacaact	ttggtgctgg	aaacacaagt	aatgcacaag	240
acagctgccc	tccagtgtca	ggatcctgtg	aaacagcata	tcaaaagatc	gccagcttct	300
tataattttac	acactttcat	ttaggattgc	ttttttgaag	aaaaatcttt	aagaatgcc	360
tttttaattt	aatatccaga	accctggaat	ttaaaaaaac	ctaantgaaa	ggaaattaac	420
tggtaccatc	aaaaatgggg	ntgntgggtg	gancntgtgt	gaagttaggg	aattctatgg	480
ctttttttta	gatgccccgg	aaaatttaac	cccttaatng	cangtttaat	ttngaattcn	540
cnccaggtan	tgtatgttng	gctcanatta	gtanc			575

<210> 124
 <211> 570
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(570)
 <223> n = A,T,C or G

<400> 124
 actgagacaa tgggttagggg tggttttctta attcttttcc tggtagggca acaagaacca 60
 tttccaatct agaggaaagc tccccagcat tgcttgcctc tgggcaaaca ttgctcttga 120
 gttaaagtac ctaattcccc tgggagacat acgcataaac tgtggagggtc cgaggggatg 180
 agaagggtata cccaccacct ttcaagggtc acaagctcac tctctgacaa gtcataatag 240
 ggacactgct tctatccctc caatggagag attctggnaa cctttgaaca gccagagct 300
 tgcaanctag ccttacccaa aangactgga aangagacat atctntcaag cttttttcag 360
 gaangcgtnc ctgggaatcc aaggaacttt ttgatgctaa ttanaaangc ttgggactta 420
 aaaatgtccn ctangngtg gcacttttac angtttttg aaangcttnga aggcagang 480
 gggtcnaana ntnaaaanac nnttgacntg ntaatanngg aatantangg cnaatggaaa 540
 ctgngttggg ggaggatcaa tttaaagagg 570

<210> 125
 <211> 593
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(593)
 <223> n = A,T,C or G

<400> 125
 ggtacagaga tttaaatgaa atcttcgaaa gaataaatTT gcttttccagt ccaactgtatt 60
 ttcaaaattg attatcacca agcttggatg aaagctgtga accacaaacc atttgtttat 120
 ttaatagaaa aaagaatgtg tagattatta gcaaagtaat gccttaaaat gtatcttcac 180
 acagttgaaa ttttagtata aacttgata tcaagttgct ttccattatt tattctactt 240
 taaaaatata tacaactatg atgttcaa atgtattctg agccattatg ttcaaacata 300
 aatatctggg aaattcaaac tgctgcaaca agttaggaaa ggattaagga aaaatgatga 360
 gctacaaatt atgtagttgg aggaagaaaa aaatgttact tagcatttat gtctggatag 420
 gtatgtattt tctaatttac atacacatat ccagttgagt atagaccacc atcaaaatgt 480
 accagttaca cagagactag actaaaccac cctatttcta tacaggtacc atagtggatt 540
 caaaaattta atatctcata gttcccaaaa ttattgnggn aatatgctna ttt 593

<210> 126
 <211> 592
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(592)

<223> n = A,T,C or G

<400> 126

acgcgggggg	gccttccggg	acgagggcgc	gtgggtgagg	aaggtcaggt	ctaggaactc	60
taactccttg	ccactcaaga	aatgtcctcc	ctttcagaat	atgccttccg	catgtctcgt	120
ctcagtggcc	ggctatttgg	tgaagtcacc	aggcctacta	attccaagtc	tatgaaagtg	180
gtgaaactgt	ttagtgaact	gcccttggcc	aagaagaagg	agacttatga	ttggtatcca	240
aatcaccaca	cttacgctga	actcatgcag	acgctccgat	ttcttggact	ctacagagat	300
gagcatcagg	atthttatgga	tgagcaaaaa	cgactaaaga	agcttcgtgg	aaaggagaaa	360
ccaaagaaag	gagaagggaa	aagagcagca	aaaaggaaat	agtgttggtc	ccttcaagag	420
ggagactttc	ttcctaattg	ccggaaagaa	gaaagtgcac	ttattggctt	tccacatatt	480
ggaggaatgt	catcttccta	aatgaagttt	atthggagga	acacagtcac	ttccttggtg	540
aaactaatcc	ggtacattgn	ggttggtttt	ttgaacacac	ctactgggca	aa	592

<210> 127

<211> 600

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1) ... (600)

<223> n = A,T,C or G

<400> 127

acagtgggtcc	ttttcagagt	tggacttcta	gactcacctg	ttctcactcc	ctgttttaat	60
tcaaccacgc	catgcaatgc	caaataatag	aattgctccc	taccagctga	acagggagga	120
gtctgtgcag	tttctgacac	ttgttggtga	acatggctaa	atacaatggg	tatcgctgag	180
actaagttgt	agaaattaac	aaatgtgctg	cttgggtaaa	atggctacac	tcatctgact	240
cattctttat	tctatttttag	ttgggtttgta	tcttgccctaa	ggtgcgtagt	ccaactcttg	300
gtattaccct	cctaatagtc	atactagtag	tcatactccc	tgggtgtagt	tattctctaa	360
aaagctttta	atgtctgcat	tgcanccagc	catcaaatag	tgaatgggct	ctcttttggc	420
ntggaattcc	aaaacntcag	agaaatgggtg	tcacaaagga	gaaccttcac	aaccccntga	480
anggattaaa	aagccccaaa	tgggggggaa	tgataatagc	acttaaggct	ttaagaattg	540
gncacanttt	caccttgtag	acccatttna	cnatngngcc	taannngctnc	ctnctncaan	600

<210> 128

<211> 588

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1) ... (588)

<223> n = A,T,C or G

<400> 128

ggtacttttt	tttttttttt	tttttttttt	tttttttgag	acggagtctc	actctgtcac	60
ccaggctgga	gtgcagtggc	atgatcttgg	ctcactgcaa	gctctgcctc	ctgggttcac	120
gccattctcc	tgccctcagc	tcctgagtag	ctgggactac	aggcgtccgc	caccacgccc	180
agctaatttt	ttgtattttt	gggtanana	gggttttcacc	gngttagcca	ggatggntcc	240
catctcctga	cctcgtgatc	tgcccacctn	ggccttccaa	agtgcctggg	ttacaggcat	300
gagccacggc	gcctggccag	gatgggtatat	ttttaactcc	ttcactgggc	cccacccctg	360

actttctgct	ttangaggtc	tgggggtgagg	ctgaanatct	ggggggccaca	cttcgagagc	420
aaccaagact	gtaagtgggg	ccttccanag	cccaatgaag	ggaatactta	ggtacaggan	480
gtgtctgcat	ggncncangt	gtgggggtttn	cttctcggcc	ttaaccagaa	agtatctctg	540
gttttaattt	taaaatgaaa	atttttaaagg	gtgnctgaaa	cnaattgg		588

<210> 129

<211> 588

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(588)

<223> n = A,T,C or G

<400> 129

ggtactgccc	tctccagatc	agcagttcag	gagagcacag	gaggcaaaac	acagattgct	60
gggcttattg	gtgccatcat	cgtgctgatg	gtcgttctag	ccattggatt	tctcctggcg	120
cctctacaaa	agtccgtcct	ggcagcttta	gcattgggaa	acttaaaggg	aatgctgatg	180
cagtttgctg	aaataggcag	attgtggcga	aaggacaaat	atgattgttt	aatttggtatc	240
atgaccttca	tcttcaccat	tgtcctggga	ctcgggttag	gcctggcagc	tagtgtggca	300
tttcaactgc	taaccatcgt	gttcaggacc	caatttccaa	aatgcagcac	gctgggcta	360
attggaagaa	ccaacatcta	taagaataaa	aaagattatt	atgatatgta	tgagccagaa	420
ggagtgaaaa	ttttcagatg	tccatctcct	atctactttg	caaacattgg	tttctttagg	480
cggaaacttat	cgatgctgnt	ggcttttagtc	ccttcgaatt	tacgcaagcg	cacaaacttt	540
gaggaaaatc	cgaaactgcn	aagcaagntt	gntacaagtg	acccaaan		588

<210> 130

<211> 190

<212> DNA

<213> Homo sapiens

<400> 130

ggtacaaaaa	aaaccttaca	taaattaaga	atgaatacat	ttacaggcgt	aaatgcaaac	60
cgcttccaat	tcaaagcaag	taacagccca	cggtgttctg	gccaaagaca	tcagctaaga	120
aaggaaactg	ggtcctacgg	cttggacttt	ccaaccctga	cagaccgcga	agaccccgcg	180
tacttttttt						190

<210> 131

<211> 386

<212> DNA

<213> Homo sapiens

<400> 131

ggtacagaac	tcagaggaaa	aaagaaatta	aatttttagct	ttctggagag	cagccctct	60
ctggcaccat	caaacacttc	tttgtttccc	ttcaacttgg	aactcttcaa	acatcagggg	120
ttgtgagggt	ttggccattc	ttttatcttg	gggtccatgtg	agtgcagaaa	atgggtcggc	180
ctgggaaaga	tctccctcct	ttacattttc	tcttctccct	cctcctcctt	attctaaaac	240
tgtgcctcca	acagaggggc	aggggctcct	gtagagagat	ccctggccca	ggacaggaga	300
tgccaaatct	aatttatctc	actgagggcc	tttgagaaaa	acgcttcagg	gccaggctca	360
gtggctcatg	cctatataat	cccagt				386

<210> 132

<211> 593
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(593)
 <223> n = A,T,C or G

<400> 132

actgagacaa	tggttagggt	tgttttctta	attcttttcc	tggtagggca	acaagaacca	60
tttccaatct	agaggaaagc	tccccagcat	tgcttgctcc	tgggcaaaca	ttgctcttga	120
gttaagtga	ctaattcccc	tgggagacat	acgcatcaac	tgtggagggtc	cgaggggatg	180
agaagggata	cccaccacct	ttcaagggtc	acaagctcac	tctctgacaa	gtcagaatag	240
ggacactgct	tctatccctc	caatggagag	attctggcaa	cctttgaaca	gcccagagct	300
tgcaacctag	cctcacccaa	gaagactgga	aagagacata	tctctcagct	tttccaggag	360
gcgtgcctgg	gaatccagga	actttttgat	gctaattaga	aggcctggac	taaaaatgtc	420
actatngggg	gcactctaca	gtttttgaaa	tgctaggang	cagaagggca	aaaataaaaa	480
acatgacctg	gttgaaggaa	naaaagcaaa	gaaacttggg	ngggaggaca	attaaaaaga	540
gnncctggga	tccctnttcc	ttaggtccct	ctcttacnaa	ggacnctntt	tat	593

<210> 133
 <211> 588
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(588)
 <223> n = A,T,C or G

<400> 133

acagancatt	nnnagcnctn	gcacaggnta	cagaacctna	cagacccaaa	ggaacatcgg	60
ataggcnaag	cgactacagg	aggcgtgtgt	gcgcttgggc	naggtaaaca	gggtcagtat	120
tggtcnngtg	acaagagnca	cgaantctgg	ccngacantg	angtnaanaa	ggtnnatnnt	180
ttnacantta	tnnnanatat	nnnnnaannt	attaantctg	ancanntgat	tttnacacct	240
anttactaga	aaactaanga	aagcactnat	tagctctgaa	tnaantnaca	tggnaaagcct	300
tttactaatc	tncaaanaaa	ccttctctgc	antatnnnaa	agattttatn	atacaangng	360
gnnnatcnct	cnatcatann	gggttctatt	ananaaccct	gctaantntg	cgacttacag	420
aacanccagc	ntananatga	ntttcatgcc	catttgggaa	gcatngcccc	ggatcacaaa	480
aggaaacctt	ctaaagnttt	ctgttatacc	agccttcntt	cntatcantg	catgngnana	540
nanaaccntt	gaagggtntc	cnggggactt	tnttctnttn	ctttgccc		588

<210> 134
 <211> 618
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(618)
 <223> n = A,T,C or G


```

<400> 134
tcnagcggcc nncnnggcag gtacantcac annttnnang anctnaacac anactanctg      60
nngtcaaata ttnaacaaaa gcantagatg aanctgctta acattcacgg aaaaacaacc      120
aaaagaaggg aggggtgata aaccanaaaa atgantgacn aaaactaaga gacctcatan      180
gngtctttac aatcnngaat tcagatgcaa ggaacagacn caaanctgtc taaaatgtna      240
cctatgaggg nacanaaagt gacttaaagt ctggtntnan taaaaaatga caacccttat      300
cctagagagt cttacnttat ttaatccana cnttatntaa cgccncngat ttttgnttgg      360
ngctatggng ttnatntnt atcagaanga antgtgggac anatgcatta ctgnttgttn      420
aaagncttn acagctaatt cacncccnng ggcattggca aaaaggnaaa aaccnggnca      480
tatattgntg anatgaaaaa accacntggt aaaaaataa ntgnagccna ntgngttttn      540
natgataacc aaatnttnac nttcagtann ngccttttan aagttggtga actccgaaat      600
ctnctttttt aaaccngg                                     618

```

```

<210> 135
<211> 374
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc_feature
<222> (1)...(374)
<223> n = A,T,C or G

```

```

<400> 135
actttttttt tttttttttt tttttttttg gggatggagt ctccactctgt tgtccaggtt      60
ggagtgcagt ggtgtgatct cggctcactg caacctntgc ctcccaagtg attctcctgg      120
ctcancctcc tgagtagctg ggactacagg catgcactac catgcccggc taatttttgt      180
atthtttagta nanacagggg ttcaccatgt tggccaggct ggtcttgatc tcctaattctc      240
aggtgatccg cctgcctcan cctcctaaag tgctgggatt acaggcatga gccactgtgt      300
ntggccaana ncactcgtaa gaaggatggc agtatcacia aatcaagcca gagatacaga      360
gattaccgcg gtcc                                     374

```

```

<210> 136
<211> 581
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc_feature
<222> (1)...(581)
<223> n = A,T,C or G

```

```

<400> 136
actccagcct tgctgaagct gcctcaaagg ctgatgggtt ggcagttatt ggtgttttga      60
tgaagggttg tgaggccaac ccaaagctgc agaaagtact tgatgccttc caagcaatta      120
aaaccaaggg caaacgagcc ccattcacia attttgacct ctctactctc cttccttcat      180
ccctggattt ctggacctac cctggctctc tgactcatcc tcctctttat gagagtgtaa      240
cttggatcat ctgtaaggag agcatcagtg tcagctcaga gcagctggca caattccgca      300
gccttctatc aaatgttgaa ggtgataacg ctgtcccat gcagcacaac aaccgccaac      360
ccaacctctg aagggcagaa caagtggag ctctattttg atgattctga gaagaaactt      420
gtnttcttca agaacacaac cctgcttctg acataatnca ataaaaaat aatttttaaa      480
aataaattat ttcaatatta ncaagacaca tgctttnaat natctgtaaa ctaaaaacta      540
aaatttantc tactgnttaa tcnaanataa taatagcttc a                                     581

```

<210> 137
 <211> 504
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(504)
 <223> n = A,T,C or G

<400> 137
 ttttncaaan nnaagttttt tacttccnaa aantnatggc taaggggngg gnggngggng 60
 aaaaaagnaa aacaaaaaaa ccccaaaaaa atggggnggn naaaaggggg gganaaaaaa 120
 ccnntntttt ntaaaantntn acaaggcaag ngcnnangga aaaaaaaaaa ncctgnaaaa 180
 tccccncgng nnggggnaaa natnnnggtt tccttttgnt ttnaaacccn ntngangnaag 240
 gntntcccc ntncctctna atnaaaaatt tntntnccng ggcennaacc nccntanggg 300
 naaattccac cncnctgggg gccgttanta agggateccna gctnggccca ancttgngga 360
 aacatggcaa aactgttcct nnggnaaaat gtttccctc anaattccca naaaataaaa 420
 ccggaacata aagngaaaaac cngggggcct aagngggncn cacnccattt attgggggtg 480
 ccncgncccc tttcaaangg aaac 504

<210> 138
 <211> 386
 <212> DNA
 <213> Homo sapiens

<400> 138
 acaacaaata acactgtgac tccaacctca caacctgtgc gaaagtctac ctttgatgca 60
 gccagtttca ttggaggaat tgcctgtgac ttgggtgtgc aggctgtaat tttctttctt 120
 tataaattct gcaaatctaa agaacgaaat taccacactc tgtaaacaga cccattgaat 180
 taataaggac tgggtgattca ttgtgtgaac tcaactgaagc caaaatacta tcttttaaga 240
 tgtcccatat ggaagacgct attccaggat ctttaaattt ccatggatgc atataggatg 300
 ttgaggagca tcatccgtga agaaaaaatc aattaaatca ttgtgttcaa caggaatatt 360
 taaaataaaa aaaaaaaaaa agtacc 386

<210> 139
 <211> 586
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(586)
 <223> n = A,T,C or G

<400> 139
 ggtactcaag tttataatgt ccccaaacct taagactaga aaatcatccc aagaaaaagg 60
 cctatagtgt gtttaatttc accctgagaa tactgtgata aaaatcaata tatttcagag 120
 ctagtaagta tttaaaaatt agtgtctcaa aaaggggaca tcataaggga aatacagggt 180
 ttagaggtct gagctcaagt ggtgtaagac agttctttct tcttctctct ttaaactctt 240
 cactttgctc taacacggaa gatgggggac agtgatcccg aagggtattac taaaatattg 300
 cagctttcag taattatgag aagcacagat atcaccagaa aagaaagcaa tcatttggag 360

tactaagaaa	cgaaacaatg	ttatttgggtg	gtgtataatt	ctacttttct	agtagattac	420
tgngtggaat	tctgtgaaaa	atatttgaga	aaangcctgt	attgcataaa	taaatctttg	480
tatgttgcaa	aaaaaaaaaa	aaaaaaaaagt	acctgcccgc	cgncccaang	gcgaattcca	540
cacctgcccgc	cgtctagngg	tccacccggt	ccacttgggt	atatgg		586

<210> 140
 <211> 591
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(591)
 <223> n = A,T,C or G

<400> 140						
acagggagga	atttgaagta	gatagaaacc	gacctggatt	actccggtct	gaactcagat	60
cacgtaggac	tttaatcggt	gaacaaacga	acctttaata	gcggctgcac	catcgggatg	120
tccctgnacc	aaccttcaag	gccnaaaccc	nnntgggtggn	tttggnctnt	aaatnaggat	180
ggccctgtnt	tccttaggta	acttgttccg	ttggtcaagt	tattggatca	attgagtata	240
gtagttcgct	ttgactgggtg	aagtcttnac	cnngtcctnt	tnngtgggg	tttttttagg	300
naaaagnctt	ttggtnacat	nnnggggggg	gnaggggact	gaacctttat	tnnttccaaa	360
tnacacctta	antcagggac	aanaaacatt	ccaanaacca	caatctttta	aaaaattaac	420
tngccagtgg	gaatgtttta	aaanntnaa	ggtctttttt	gccttggttt	ttgtgggggt	480
ctctcttccc	ccccctgggg	ttaatttttn	aagccgggac	ctcncnaana	cccctttttt	540
caaagggccc	naaaccccc	ccccnaaaa	aaaaaaaaaa	aaaaaaaaanc	n	591

<210> 141
 <211> 592
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(592)
 <223> n = A,T,C or G

<400> 141						
ggtacacaaa	ccaagacaat	atcaggggtga	caggtgaatg	aacttaaatt	ctcagtcttg	60
tctattcacc	aaaaaagtat	actgcctggt	ttttctttaa	ttattcaagg	ttgatgactt	120
ttaggaacat	gttttatact	gtatttttta	attaaagcaa	gtgccttgat	gtaattccat	180
gtaaatacatt	gcttaaccct	cttatgggat	gaggatgagt	tattaatgta	ttgcagccta	240
ctggaaagga	gggggagttg	gttaatagca	gatacttttc	ttctagaagc	ttatgtttta	300
tgctgtttat	tatgtaagat	cctgtatgtg	tggttgagatt	tagaggtttc	atttgttttg	360
tctgctaata	aattgtttact	ctaataataa	cnngnnnaaa	naaannnnnn	nnnnnnnnnn	420
nnnannnggt	ncctgcccng	gcggccgctc	gaaaggcgca	attccancca	ctggcnggcg	480
gtactaaggg	gatccgnctc	gggncccaac	ttggcgtaat	atnggcatac	tggttcccgg	540
gngaaatggt	atnctgcaaa	ttccccaaat	acnaccggaa	ncttaagggt	aa	592

<210> 142
 <211> 595
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(595)
 <223> n = A,T,C or G

<400> 142
 acaacacctt cattcttaat gcttcttagg gcatcacagg ttttagaaat taatgtattt 60
 ttagcattcc acagtaatga tcactttcaa aaactgcaat atacatctgc atgttacact 120
 gacatacaac acataagtat tttgtcacac atcaactttt agcctcaaat aatagaatac 180
 aaaaagctac actggacata acaccaccga acttttgaat atcccccttt cccaattgtt 240
 aacaggtagt actgggatta taaaaagaag agattagaga attttatcaa tgttcccact 300
 ttaaccctat ttaacagata taaaaagaag agattagaga attttatcaa tgttcccact 360
 gtcaaataga atataagcaa tgatacaaaa tgttgagtct tcatcctcta actccagatc 420
 ctggtatatt gccctacatt tctatacatt aatactaact tatacactga atacaagagt 480
 naaaccaact gtcnngggctt aatangngga aaatgctctt gncctaaanc accaggggtg 540
 ctnggtttat tcctacatgt ggactaaaan gnaatcatct ttatggcngg aaana 595

<210> 143
 <211> 620
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(620)
 <223> n = A,T,C or G

<400> 143
 actactcgat tgtcaacgtc aaggagtcgc aggtcgccctg gttctaggaa taatggggga 60
 agtatgtagg agttgaagat tagtccgcgc tagtcggtgt actcgtgtga agttggcagg 120
 gacggttctt gtcactttct tgggcttatt tgggtgtgctg ttgaaggggg gagactagag 180
 aaatggcagg gaacctctta tccggggcag gtaggcgcct gtgggactgg gtgcctctgg 240
 cgtgcagaag cttctctctt ggtgtgccta gattgatcgg tataaggctc actctccgc 300
 ccccaaagt ggttgatcgt tggaaacgaaa aaagggccat gttcggagtg tatgacaaca 360
 tcgggatcct gggaaacttt gaaaagcacc ccaaagaact gatcangggg cccatatgct 420
 tcgaggntgg aaanggaatg aattgcaacg ttgtattccn aaagaagaaa atggttggaa 480
 gtaaaatgtt ctttatgacc tcncaacctt ataaacncat ccgtttnttt acaaccttta 540
 accacatggg aagttcattn aaaaaaactg aaaactttgn aaagnttttt ttnnccttga 600
 aaagggaact tacctcgccc 620

<210> 144
 <211> 613
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(613)
 <223> n = A,T,C or G

<400> 144
 cgaggtagctt tttttttttt tttttttttt ggggtcagtg gtgatatccc cctaatacat 60

tctgattgng	ttccttttaa	tcttctctca	tttctttttt	attagactag	atagtgattt	120
atctatttta	tttaattttt	caaaaaatca	cctcctanat	ttgttgtttt	ttaaggggtt	180
ttatgtctct	atctccttca	gttcaactct	gatcttggtt	atttcttgnc	ttctgctaga	240
tttgggggtt	gntttctgnt	ggntctctaa	gttctttttg	ntgngacatt	agattgncaa	300
cttaaaatct	ttctagctat	ttgacgtggg	catttaatgc	tataaatttc	ctggtaacac	360
tgctttcgct	gtatnccana	naatctggga	tgggtggggcc	ttggtttcaa	taanttccaa	420
tacctcttaa	gggggngggag	ccaanaagan	ctaatagggg	cagcactgct	ctgggctncc	480
atcaanaagg	acaaaaactg	ggagngaccc	tgettnttca	ctgaggnacc	ggcccggccg	540
gccgtccnaa	ggcgaatcca	cncnctggcg	gccgtctatg	gatccacccg	gnccaactgg	600
ggaatatggc	aaa					613

<210> 145

<211> 345

<212> DNA

<213> Homo sapiens

<400> 145

acactgatct	acaaaaat	taaaatgagc	cgggcgcggt	gactcacgcc	tgtaatccca	60
gcactttggg	aggccaaagc	aggcggatca	tgaggtcagg	agatcaagac	catcctggct	120
aacacggtga	aaccccgctc	ctactaaaaa	tacaaaaaat	tagccgggtg	tggtggcggg	180
cacctgtagt	cccagctact	cgggaggctg	aggcaggaga	atggcggtga	gccgggaggt	240
ggagcttgca	gtgagccgag	atcacaccac	tgcactccag	cctgggcaac	aaagcaagac	300
tctcaaaaaa	gaaaaaaatt	tttttttaaa	tgagctgggt	gtacc		345

<210> 146

<211> 475

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(475)

<223> n = A,T,C or G

<400> 146

actacaagg	ttagcatttg	ctctgctggt	cgacattccc	ccagtctatg	ggttgtatgc	60
atcctttttc	ccagccataa	tctacctttt	cttcggcact	tccagacaca	tatccgtggg	120
tccgtttccg	attctgagta	tgatggtggg	actagcagtt	tcaggagcag	tttcaaaagc	180
agtcccagat	cgcaatgcaa	ctactttggg	attgcctaac	aactcgaata	attcttcact	240
actggatgac	gagaggggtga	gggtggcggc	ggcggcatca	gtcacagtgc	tttctggaat	300
catccagttg	gcttttgga	ttctgcggat	tggatttgta	gtgatatacc	tgtctgagtt	360
cctcatcagt	ggcttcacta	ctgctgctgc	tgncatgttt	tggtttccca	actcaaattc	420
atttttcaat	tgacagtc	gtcacacact	gatccagttt	caattttaaa	agacc	475

<210> 147

<211> 629

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(629)

<223> n = A,T,C or G

```

<400> 147
cgagggtacgc gggatttgaa tcttaaactg tatttttctc ttagtattgc taatgagtaa      60
agaaaagtct cataaggtag ccaaatgaaa aagaatgaaa gggaaagtga aaaattaagg      120
ggacaaaaga tgggatgtga aaagaagaat tctagtttga tggtgactca tattcacgat      180
aggatacaaa gtgtgatttg ttggaacat gtcccaaatt tctaaaattc tgcttctctg      240
ccaaaagcaa tgtctttctt gggtgatatt tgagttttaa aagggtcaaa tcttttctaat      300
tttttgatc tttagagggc agcactagaa gaaatcagca ggtctaatac caccagtaag      360
aaaactacca cttcttgatt ttacagatt taaaaaaatc ttttcagtgc ctttcttttt      420
aatgtaaata caaatttaaa cctangctta atatagcgtt tccctttccc caagtgatgt      480
cnaggtcgat gccaaatcaa tgatccnaaa tgatcgnggt naaaataact caaaggggtc      540
ttaaggngag tngcatgcca aaaaatacct tgattccggg ggtttggacc tggctttggt      600
ggggcctntg aaatgccaan ttanccan

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<210> 148
<211> 614
<212> DNA
<213> Homo sapiens

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```

<220>
<221> misc_feature
<222> (1)...(614)
<223> n = A,T,C or G

```

```

<400> 148
acaaaagagc ctgattcttt ttaattccac aaatacctag catctcaaag taacatgtaa      60
acaaacttct atgctgtctc atgaatcctt ccaatttcga taataaacta aatagtattg      120
gatctagtat atgactttca tgtgtaagtt atggttctat ccattacttt aacaatatta      180
ctgatgtaac agagaaaaat tttcaactat tgtatttatt taaaacaaac tgacaagttc      240
aagcacctgt cttcagaaaa gccagcagca tttttttttt ttaacatact caaagtaaga      300
tttggcctaa gcccttaata ctttctgaa cagccatgca actaaacacc ctcagggaga      360
tgttacataa gggagagaag aacatggagc aatttgcact tttccctag ataataattaa      420
caaggnaaag caaatncaga tctttatgaa tgaatggntg gcatgggtta tcaactggac      480
tttttaact agagncncta tcatattggt aaatagaaan aaaggatttt aataaagctc      540
tncctgcttc aaaattaagg ggacnttttc tgggaggctt tcagggacca taataaggta      600
aaaggggacg gttg

```

```

<210> 149
<211> 628
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc_feature
<222> (1)...(628)
<223> n = A,T,C or G

```

```

<400> 149
nccgaggnac tttntttttt tttttttttt ttttnaacag cgncttttca tttttattac      60
tcaaaaaagt ttcatttttt tatttaagct ttctgactct gngcttgggc cttcaacact      120
ttcacaacga ttttctgctc ctcgataagg aaagcccgtc tgatccctana aaggaaaata      180
ccaaattaat catctcttta aaatgaactt cattttttat ttagcccaaa aaaggnaaac      240
atggtaaaga accaagcnaa gcaatcaggg aaccaggaa actacnggat acccaatac      300

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ngagtaaaac ttaaaagggg aaattcattt aaagcaggga aatccctcaa tttcatgccn 360
gtagtattct gncctcctct gagcaagaat aactatgaag catccccag gagaccacnt 420
atgagactta attattggta ggatccagga atagnggnat ttnttgattt gcaaaangtn 480
taaaaaattt taaccctntt ttgaaaattc ccagnaaaaa caccncataa ggggctntgt 540
gttaaaacta aaattaaagg gaagggtttt tccagaaacc ccccccana cagggtttna 600
accggttang gcanntcncc aaaccnan 628

```

```

<210> 150
<211> 509
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc_feature
<222> (1)...(509)
<223> n = A,T,C or G

```

```

<400> 150
ttggggaann aaaaaaaaaac tttttttttt nggggnnnngg ggntgcnanc natncaaaaa 60
tcaaaancnt ntttgggttt taactttttt ttttttgntt gncaaannaa aantaaantt 120
tntttttana tttgctaang ggcngancn gcnnaaaaaa nccttttttn gggaanctt 180
nggggcaaat tntttnancn accctttggg anaacttttn ttaggggggn nnaaccgnc 240
atttttgccc acttttttcc cttttgntta anggggnctt tgggcnngac cnccttagg 300
ggnaattcac ccnctggggg gcgttatntt ggatccactc ggnccaactt gggggaaaaa 360
gggaaaaacnt tttctggggg aaattttttc ccncnaaatt cccaanaana aaaccggaac 420
nnaaanttaa acccgggggc ccaaggnggg ccnnccntt nttgggtggg cctgcccct 480
ttaangggaa attttggccc tttttaaaa 509

```

```

<210> 151
<211> 622
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc_feature
<222> (1)...(622)
<223> n = A,T,C or G

```

```

<400> 151
ggtacttttt tttttttttt ttttttttgc tttggacaaa tttattgaaa catacaggcg 60
gctgttagca gagaaatcat tccatgattg atgtgttaca tttggccact accttgaatg 120
tataatttaa aaattatatt tttcacaact aagccttttg ccaaaaaagt catttagcac 180
atcttttaaag atcaataaga aatggatttt ggacattaaa aagatcaagt cactgaatta 240
aacagtagca accccatta atctagaatc ccatagtgtc gaaggtagag gtgtctgtgc 300
aaagctagtc atttgttaac agcaatcana aaanatgggg gcaggcacac ctgtcaaaag 360
tggaacana nctggcagga caggacggct gggctggtct ggtcaggtga gcatgtacca 420
aaaacagcag caacagaaaa cccgtccacc angcttgtga agcangtga tggctctagc 480
tcactnttn ttttggntt ntancacata cactgngggg ttangangnt tctgaggnc 540
accttgcnc cctacctgcc cgggngggcc ttnaaagggg aattccacca ctggggggccg 600
tctaattgga cccacctggg cc 622

```

```

<210> 152
<211> 313

```

<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(313)
<223> n = A,T,C or G

<400> 152
acggtggatt agttcttttc agcatgttcc ttctgtatga taccagaaa gtaatcaagc 60
gtgcagaagt atcaccaatg tatggagtcc aaaaatatga tccattaac tcgatgctga 120
gtatctacat ggatacatta aatatattta tgcgagttgc aactatgctg gcaactggag 180
gcaacagaaa gaaatgaagt gactcagctt ctggcttctc tgctacatca aatatcttgt 240
ttaatggggc agatatgcat taaatagttt gtacgcgggg aaaaaaaaaa aaaaaaaaaa 300
aaaaaaaaa acc 313

<210> 153
<211> 620
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(620)
<223> n = A,T,C or G

<400> 153
cgaggtacgc gggaggggcaa caagaaccat ttccaatcta gaggaaagct cccagcatt 60
gcttgctcct gggcaaacat tgctcttgag ttaagtgacc taattcccct gggagacata 120
cgcacaaact gtggaggtcc gaggggatga gaagggatag ccaccacctt tcaaggggtca 180
caagctcact ctctgacaag tcagaatagg gacactgctt ctatccctcc aatggagaga 240
ttctggcaac ctttgaacag ccagagctt gcaacctagc ctacccaag aagactggaa 300
agagacatat ctctcagctt tttcaggagg cgtgcctggg aatccaggaa ctttttgatg 360
ctaattagaa ggcctggact aaaaatgtcc actatggggg gcactctaca gtttttgaaa 420
tgctaggagg caaaaggggc agagagttaa aaacatgacc tggtagaagg aanaaagcaa 480
aggaaactgg tggggaggat caattagaga ngaggccctg ggatccnct nttcntaggn 540
ccctctcata cnaaggacac tttttatatg ctttcccaaa ctgntnggga agggtnaaac 600
caaatccgg ggtanaacct 620

<210> 154
<211> 339
<212> DNA
<213> Homo sapiens

<400> 154
ggtacctgga ggatatagac ctgaaaacac tggagaagga accaaggact ttcaaagcaa 60
aggagctatg ggaaaaaaat ggagctgtga ttatggccgt gcggaggcca ggctgtttcc 120
tctgtcgaga ggaagctgcg gatctgtcct ccctgaaaag catgttggac cagctgggcc 180
gtccccctct atgcagtggg aaaggagcac atcaggactg aagtgaagga tttccagcct 240
tatttcaaag gagaaatctt ctggatgaaa agaaaaagtt ctatggtcca caaaggcgga 300
agatgatgtt tatgggattt atccgtctgg gagtgtggg 339

<210> 155

<211> 450
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(450)
 <223> n = A,T,C or G

<400> 155
 cgaggtactt tttttttttt tttttttttt ttttttntat ttttgtttaa tttattttaan 60
 accacctnct tacaacttnc anagagaaaa tacaaaacaa gaaacanact tggtttnaaa 120
 tgcataacca gntgctggan tttaaagcat tactgataac attgttacan aanaatggca 180
 nnttactcna gggcacttna gtattcctna ggaataaaca ttgatttctc ttgtectccc 240
 nntgggatgt tctcangtna agtcactgcn cctgcnccta gacatatttt ccattgtmca 300
 naananggag cctgnaaant atgctnacag tnggaataag ccattnctaa ttccatgcca 360
 naaccnangg ctaatggnc attctttttt aataaggtat gtggaaaana ttentatccc 420
 aaanaaaant tgcccggncg gtctntntaa 450

<210> 156
 <211> 760
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(760)
 <223> n = A,T,C or G

<400> 156
 cgaggtactg cccagtgaa aatggaactg aaagagcctg tagctgtcag agaaaggacc 60
 acctttcagc actgatcggg tatcgttggt ctcaaaattt acatggaagg aatgccccac 120
 attgataatt tctttggctg tggctggggt gtaggagaca ctaatagggt tcagagaggt 180
 gtcattgttg gtttactggg ttttaatatc aacaggggac tggttatttc cattggcaat 240
 gggatacagc ttgtccatt gtccaggacc atttttgtca tcataatccc agtctggact 300
 tgccattatc ttctactgag ttttcttttt ctgaaaacaa aaataatacc tggataaact 360
 aactgcccc gcgtcctgcc cgggcggcca aaggggcaat tccaccactg gcggccgtac 420
 ttatggatcc aactcgtccc ancttggegt aatatggcat aactgttctg nggnaaatgt 480
 atcccttaca attccncac atcnaccga acctaantgt aancctnggn gcnnataagg 540
 actactnctt aatgggtggc tctgncnttt caannngaac cttngcnctn gntatgattg 600
 ccaccccgga naggggtggg ttggccttcc ntcttgatann aatcttcncg gnttggttga 660
 anggtntct taggggatng ttccaatggg gaccgnaanc ttccagccna ggcaccaaana 720
 cnttggttta nccccacnn aaaantanag gggncngggg 760

<210> 157
 <211> 668
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(668)
 <223> n = A,T,C or G

```

<400> 157
ggtaccacagt agtcattcag gaacagggttg ttcagtttcc atgtagttga gcgggttttga      60
gtgagtttct taaacctgag ttgtcgtttg attgcactgt ggtctgagag acagtttggt      120
ataatttctg ttctttttaca ttgtctgagg agtgctttac ttccacctat gtggtcaatt      180
ttggaataag tgagatgtgg tgctaaaaag aatatatatt ctgttgattt gaggtggaga      240
gttctgtaga tgtctattag gtctgcttgg tgcanaagctg agtcaattcc tggatatcct      300
tggtaacttt ctgcttggtg ntctgtctaa tattgacagt ggggcgttaa agtctcccat      360
attattgtgt gggagtctaa tctcttttga ggtctctaag gacttgcttt ataaactggg      420
tgctcttgat tgggtgcaat atatttagga tagttagctc ttcttggtga atggancctt      480
taccaatatg aatggcctcc ttctttttga ccttggtgggt taaagctggt tatngaaact      540
ggatggancc ctgctttttt tggttcattt cttgnagggt cctcagcctt attttancnn      600
gnggctttgn ccncntccg cggcnttaag ggaaccacnc tgngcgtcta ngancactgg      660
caactggg
668

```

```

<210> 158
<211> 737
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(737)
<223> n = A,T,C or G

```

```

<400> 158
tttttttaag ggtcaatggt tacatttttt tcatataaat atcaagttgt cagcaccatc      60
tgttgaaaaa aatcttttga atggctaata ttttatgtca ttagatttga taatagttta      120
agaatttttg ttcttatatt catgaggggt gctttccttt aacttttttg ttttgtaatg      180
tctgtgtcag gntttactat tagaacaata ctagtctagt aaaaaaaaaa anaaacaaaa      240
aactancaag tgtntctccc ctctctatta taanaanggn gttacttctt ccttaaatgg      300
nnaaattatg agngaaactt ggagtatcnt tgcnggantg gaagtttcct tgtggaaaga      360
attttatnat nattacattt caatagtncc gntccctgc ncgggcgggn ntcaaaggcg      420
aatncagcaa attgntggcc gntactnngg accaactnct gnccatnntg ggganancng      480
tcaanctggt ctngnnaatt gtnccttcc aatnccaca nanaaccgaa cctaaatgga      540
accnnggggc tantaangnc taccnntatt gngnggctnn gcccttnnnt ggaaactgnt      600
cnaccnttat aatggccccc cnggaaggnt tntttggcct tctnntncaa anctggcngg      660
ntntgtgna gggtatctna ntggatgttc cacgggaacn gaanatntan ncagtggacn      720
aaanntnntn ttttntc
737

```

```

<210> 159
<211> 739
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(739)
<223> n = A,T,C or G

```

```

<400> 159
cgaggggtaca ctgtgagaga ataacatgga cttgatatgg catcacactt gtttttaaagc      60
aaaaaaaaaag aaaaaaagaa aaaaaagaaa gtacagttaa aaagtaagca ttgtagtaaa      120

```

tagtggattc	tctgggtgtg	atttttttatc	tcagtgttga	aaattggaaa	agaatgggct	180
gaagtctaaa	aactggaata	atgaaggaca	ctaaatgcct	ttattgtaga	tactatgttt	240
gtaagtctat	agctaagcaa	cttaagccaa	aaaggctctt	caactgaagc	tttaatcaac	300
ttattttggg	gatgttctct	tccttatctc	atgcgtcatc	cctaaaataa	taagatacat	360
gggatcaaat	aacccttgcc	ttttcaacac	aaatcagttg	gaaaattatg	ggttgagtcc	420
tggttgctgc	atggttctgt	tctcaaaatg	agtgtgtatg	acatcccac	tatgtaatag	480
gctacctttt	tggtctctgg	aactttgtcc	tgccggccgg	ccnttaaggc	nantcnacca	540
ctggcgcccg	tactatgggn	tccagctcgt	ccaaccttgc	tatcntggct	acttttctgg	600
ngaattgtac	cgtnccatccc	cacttcancg	gagctaangg	aancntgggc	ctatggggct	660
actccatatg	ctngccnctg	cnttcnangg	aacnccgntc	ttaanatgca	cccnggaagg	720
gtngtngcct	tctttcttt					739

<210> 160

<211> 802

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(802)

<223> n = A,T,C or G

<400> 160

cgaggtacag	cagagacctt	cctgcttttt	actggggact	ccagattttc	cccaaacttg	60
cttctgttga	gattttttccc	tcaccttgcc	tctcaggcac	aataaatata	gttataccac	120
taaaaaaaaa	aaaaaaaaaag	tacgcggggg	cccattgttt	ttgtaatctc	tgaggagaag	180
cagcagcaaa	catttgctag	tcagacaagt	gacagggaa	ggattccaaa	caccagtgtg	240
taaagctaaa	tgatggccac	ttcatgcctg	tattgggatt	tggcacctat	gcacctccag	300
aggttccgag	aagtaaagct	ttggagggtc	caaaattagc	aatagaagct	gggttccgcc	360
atatagattc	tgctcattta	tncaatatga	ggagcagggt	gactggccat	ncgaagcaag	420
aatgcagatg	gcagtgtgaa	gaaagaaaca	tatttacctt	taaagcttgg	tcctttttna	480
tcgaccnaag	tggtccgaca	agcttggaaa	attactngan	aaagctcaat	nggactatgt	540
gactcttttt	aataatttcc	anggnnttaa	acccgtgagg	acttttcccc	cgntaaatgg	600
aaagtatttt	gcnannggac	ttgacttccc	ggngccntaa	gngaattcac	cactgggggg	660
gnttaggggc	cnnntggnga	anttggnaaa	ngggtaatnn	cntgnaatgt	tcctcatccc	720
aantngccgn	ataantaacc	gggcaaaggg	cccaaattgn	gcctccttn	nngaattnanc	780
cctntannna	ancggggggg	gg				802

<210> 161

<211> 214

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(214)

<223> n = A,T,C or G

<400> 161

acttttnntt	tattcnttat	ttttgggacc	tgctctcact	gtccacccag	actggagtgc	60
antggcacca	ttatagctna	ctgcagcctt	gacctnntgg	gctcaagtga	tcctnctgtc	120
tacaccccc	aagnatgntg	tgacattatg	cttgataat	acttgatnt	tangtaaaga	180
cagggtcttt	ccnatnnacc	nggnagatct	naaa			214

<210> 162
 <211> 304
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(304)
 <223> n = A,T,C or G

<400> 162
 acttaggaat acaactatat acatatgatt ttatTTTTTaa gaccatatta tatttgggta 60
 tctactaata ttttGTataa agcaatTTTT tgTtccatta cgtgactttt tgttttattg 120
 tatatgtaat ttaacacaca ataaagggtA aagttgcttc cccaaaccac acttttAatc 180
 aaaacctaga atcatctgca gtccttgTTa aaaatgcagg tttctagaac cctctgaagt 240
 tctgattaaa taaattttatt gcaaatcaaa naaaanaaaa aaaaaaaaaa agnccccggg 300
 gnta 304

<210> 163
 <211> 461
 <212> DNA
 <213> Homo sapiens

<400> 163
 actagagcca gTcatcctta acaaatcttt tcacattTTa tttctttcac atgtagtcat 60
 cttcaaaaag gaaagatttg gaattTTtaga aaaggggcaa ctcttctttt tagcattctc 120
 atcagaaaagT cacaAAAatc gatggaatca tttccactgg gaagattgac cttttgtatt 180
 tatttgtggg gTaaattaat aagcattcca gatgcttgca gcttcctgca tccaggagat 240
 gctgtgttcc ccgtgatgca gctggaaccc aagctgcagc aggagatgca agtttcagga 300
 tgTtccccac tgagctggag gaatatctac agcagtgatg cttgaaattt tgtatgaatt 360
 attttgtcgc ctaccctttt cTcCaAaCa aaaattagag gattattTaa tccttgggat 420
 cttccccttt ttgagaaata aagtttttat caaaaaaaa a 461

<210> 164
 <211> 345
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(345)
 <223> n = A,T,C or G

<400> 164
 tttttttgag acaaggtctt actctgtcac ccaggctgga gtgcagtggc atgatcttgg 60
 ctcaactgcac cctctgcatc ccaggTtcaa gtgattctcc tgtctcagcc tcccttgtag 120
 ctgggattac agccacttgC cactgcaacc ggctaatttt tgtattctta gtagagatgg 180
 ggTtttaCca tgttggccag gctggTcttg aactcctgac ctcaagtgat ccacctgcct 240
 ccattgtccaa agtgctggga ttacaggcat gagccaccac ccctggccta agtcattaat 300
 ttaaaaaatg ttattaggat gancgacctg ccgggcggcc gntaa 345

<210> 165

<211> 385
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(385)
 <223> n = A,T,C or G

<400> 165
 actgaaacag aaactntacc caattgcagt ccatatgttt tctgggatcc cggagttccc 60
 tttcaacaat gtaaaataca nacttaggtc aaaagttccc atgtctgaga aaactcaagc 120
 caaatcagtt ctctcctcaaa gttgacagga tttatgtctt aaaaatagag atacagaatt 180
 ctcttttgaa agatctacca aattcctgta agaaacagtc tacccaaagt aggggaaagg 240
 ctatatgana agttcaaggc acttcttaaa aatatatctt aggttttagg gaaaggaaac 300
 agacaagttt ccagaccgtt ggggtggaatg gatgtagcag atcactgaga ggttacaagc 360
 gccgacctng gccgngacac gctan 385

<210> 166
 <211> 745
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(745)
 <223> n = A,T,C or G

<400> 166
 tttttgacga tgtctctcaa caatacctga agtttctcat actcatcatc ccaagtctga 60
 aaaacttcaa agcatgctac cataactttt tcaaattctt cataagcaac atgcatcaat 120
 ttcttagtgc ccaatacttt gagtaattga gaactcaagt ctcttgaaat tgcctccacc 180
 aaacgcagtg ccctctgaat aggatatttt gtgtttcgga tctttctcaa atccccgcta 240
 ctttgagaag ctgaggcggt agatcacttg aggccaggag ttcgagacca gtctcgtcaa 300
 catggcgaaa ccctgctcta caaaaaaaaaa aaaaanaanaa aaattagcca gacatggngg 360
 cccacatctg tagtcccagc tacttganan gctgaggcat gagaatagct tgacctggaa 420
 nggcaaagggt ttantgancc caaactgngc ctggattcca atnngngnga cccagtgana 480
 tttgtctcaa aaaaangaaa ggaaaaaaga gcccngcggg aggaaggatg gattgangga 540
 aaattgtggc ctccnnnnaa aggnccaang gccctnangt ttctttgaat agtttccctn 600
 gccnttctta ngggcctnng ccttttttct nnctggcgaa cctaggnatt cacatggggg 660
 ttangacncc gccnctggga naggaaaagtn ctggaagnnc ncntcccaat ancgnntang 720
 aacgggcngn ggannaattt tttnc 745

<210> 167
 <211> 623
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(623)
 <223> n = A,T,C or G

```

<400> 167
accagccact gcaaaaaacat gccaaaattgt aaagaccatc gaggctggga agaaactgca      60
tcaactaacg agcaaaaataa ccagctaaca tcataatgac aggatcaaat tcacacgtaa      120
cactattaac ctgaaatgta aatggactaa attctccaat taaaagacac agactggcaa      180
attggataaa gagtcaagac ccatcagtgt gctgtattca ggagacccat ctcattgtgca      240
gagacataca taggctcaaa ataaaggaat ggaggaagat ctaccaagca aatggaaaac      300
aaaaaaaggc aagggttgca atcctagtct ctgataaaaac agattttaaa ccacaaagat      360
caaaagagac aaagaaggcc attacataat ggtaaaggga tcaattcaca agaagggcta      420
ctatttctaaa tatatatgca cccaatacag gacccccaga ttcatgaagc aaatccttga      480
gattnccaaa ggattaactc cncccngtat tatggagact tncaccact ntnacctttc      540
ccgattctgn cccaaagtac cnggtttccc gaattgactn gtttgncann gggctattaa      600
tttngaattt cncccaaaaa aaa

```

```

<210> 168
<211> 703
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc_feature
<222> (1)...(703)
<223> n = A,T,C or G

```

```

<400> 168
ggtactccct gtttgctgca gaatgtcaga tattttggat gttgcataag agtcctattt      60
gccccagtta attcaacttt tgtctgctg ttttgaggac tggctggctc tgtagaact      120
ctgtccaaaa agtgcattga atataacttg taaagcttcc cacaattgac aatatatatg      180
catgtgttta aaccaaattc agaaagctta aacaatagag ctgcataata gtattttatta      240
aagaatcaca actgtaaaaca tgagaataac ttaaggattc tagtttagtt ttttgtaatt      300
gcaaattata tttttgctgc tgatatatta gaataatttt taaatgtcat cttgaaatag      360
aaatatgtat tttaagcact cacgcaaagg taaatgagca cgttttaaat gtgtgtgtgc      420
taattttttc cataagaatt gtaaacattg actgaacaaa tacctatatg gattggtaat      480
gacttatgag caanctgctt ggccagacag ttacccaaac tttatatatn tnngaaggta      540
tacactgnga aatctctggc taancgaatg cntccagggg taannnggtn tggntggant      600
aaanaatgcc ctgcaaaaaa aaaaaaaaaa aagccttccg nggccttnaa nggaatcnnc      660
angggntnnn ggccactggc cactggnaaa ngnaacgtct gga

```

```

<210> 169
<211> 609
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc_feature
<222> (1)...(609)
<223> n = A,T,C or G

```

```

<400> 169
acgtccatct tccagctgct tgccagcaaa gatcagtctc tgctgatcag gaggaattcc      60
ttccttatcc tggatcttgg cctttacatt ttctatcgta tccgaggggt caacctcgag      120
ggtgatggtc ttaccagtca gggctctcac gaagatttgc atccacctc tgagacggag      180
caccaggtgc aggggtggact ctttctggat gttgtagtca gacaggggtc gtccatcttc      240
cagctgtttc ccagcaaaaga tcaacctctg ctggtcagga gggatgcctt ccttgtcttg      300

```

```

gatctttgcc ttgacattct caatgggtgc actcggtctc acttcgagag tgatgggtctt 360
accaagtcag ggtctttcacg aagatctgca tcccacctct aagacggagc accaggtgca 420
gggtggactc tttctggatg ttgtaatcag acanggtgcg ttcattcttc actgnttcca 480
caaaaaaaca cctctgctgg canganggat ccttccttnc ttggactttg cctgacattc 540
tnatggngta ctccgctccc ttcaaaggga tgncttacan tcanggnctt acnaaaattt 600
cntccnctt 609

```

```

<210> 170
<211> 617
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc_feature
<222> (1)...(617)
<223> n = A,T,C or G

```

```

<400> 170
acaaagaaca tgtagctata ggaaataata gtgtaaatac cagtataata actggcccat 60
gtaaaataca aaaatattca ctgaagtcag gttttctata aaacagtgtt tattagaggt 120
attttactat gaatcaggca tataatctga atgtagaaac ttttagaaat attaacagca 180
ttcagtcagt gccatgcact tgtgcttcca attatttttt taaagctgct ttgttttgac 240
tcatgtgaaa tagttaaggc ctacattctt atacacatta tccattctac aaggtttaaca 300
attttacact aaaacacagt ttaaattaaa aacgattttg aaaaattaca tctatattta 360
atccctaaga agtgttttaa gctggtaatg cagctcgctg tagctctaag agaggggtta 420
gtcaggaatc tgatcttgag ccataaangg tttcaggcta aacaaagaac aaatttaagt 480
gacagaaaat attataattn caatatactc agtttttttg tataaaatac cctgctagca 540
tgccactggc tatattgngg gcataatata aaatgncggg ggggggggat ganccctcaa 600
gncaaaanttt ggaccca 617

```

```

<210> 171
<211> 621
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc_feature
<222> (1)...(621)
<223> n = A,T,C or G

```

```

<400> 171
acagtatggg ggttgtaaat tggcatggaa atttaaagca ggttcttggt ggtgcacagc 60
acaaattagt tatatatggg gatggtagtt ttttcatctt cagttgtctc tgatgcagct 120
tatacgaaat aattgttggt ctgttaactg aataccactc tgtaattgca aaaaaaaaaa 180
aagttgcagc tgttttggtg acattctgaa tgcttctaag taaatacaat tttttttatt 240
agtattggtg tccttttcat aggtctgaaa tttttcttct tgaggggaag ctagtctttt 300
gcttttgccc attttgaatc acatgaatta ttacagtgtt taccctttca tatagtttagc 360
taataaaaag cttttgtcta cacacctgc atatcataat gggggtaaaag ttaagttgag 420
atagttttca tccataactg aacatccaaa atcttgatca gttaaaaaat ttcacataac 480
ccacttacat ttaccaactg gaagaataat caatctctca agcatgggat tattagaatc 540
aacantttga aagctgtcct tgaaggctaa taaaaaagnt tgtctaacct ttcatgagg 600
ctntntntta ctncttaacn g 621

```

<210> 172
 <211> 399
 <212> DNA
 <213> Homo sapiens

<400> 172
 actcaaaatt acacatttgt ttaaataaat atccacacaa attctcagtt acatcaagta 60
 gctggtttat atttagatta tctcaagtag gggggaataa ccatgtgtag gaattcatag 120
 aaaaataaac aatcagctga agaggctctaa gaaaatgctg acttttataa tttcacttat 180
 tttccttgaa gttttctacc cttcccatcg atgataaacc aagatcatgt aatggaaaat 240
 ttcaaaccag ggctaaattc taaagtaaag cttcaattca agcccttccc ccaagagaat 300
 taattttcct gattttctct tctctcacat ctaaggagaa catttttaggc agttaaattt 360
 cagaacttca aggtttcatc agggtcacct ttatgtacc 399

<210> 173
 <211> 616
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(616)
 <223> n = A,T,C or G

<400> 173
 actttgtgga taagaaaatg gaggaacaca tctgatggag agtgggcatt tgacaacaat 60
 ggaacaggta acctgcatgt aaaatcaaaa tataagtgtc tttttaagag ctgaaagctg 120
 ctgctgggtca ttcattaatg tgtcagacat ttaatcagga tgctggacct tcaaaataac 180
 tgaaaaaaga accaagaaaa ggcgtttttg ttttcaacaa actttactaa ataaccctgg 240
 aaaggcaatg aacgatctga caatttaagc tctaattgatt taaagctcag ctagaagaaa 300
 gtgaggcatg acatatactg tcaacggagg gtgaaggagg canatttctg gaaatgcaat 360
 gatcccacca tttgcttcaa ngagaaacct gcanacatat tttcangtct tgntaagttna 420
 caactgtnta tttgtaatca atcatttngg aaaagtctgc tatgtaactt angncactgt 480
 gccccnacc accgatgaaa aggaaaaacc cctgacacca ggaaaatcct tccatcctca 540
 aanaaattaa gngaccaacn ttttaaagaaa aaaaatnanc ccncctctnt ttacaaatnt 600
 ttctntccaaa tnttcn 616

<210> 174
 <211> 631
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(631)
 <223> n = A,T,C or G

<400> 174
 ggtacgcggg gacacgcacg ccgggctgtc cagtttataa agggagagag caagcagcga 60
 gtcttgaagc tctgtttggt gctttggatc catttccatc ggtccttaca gccgctcgtc 120
 agactccagc agccaagatg gtgaagcaga tcgagagcaa gactgctttt caggaagcct 180
 tggacgctgc aggtgataaa cttgtagtag ttgacttctc agccacgtgg tgtgggcctt 240
 gcaaaatgat caagcctttc tttcatcccc tctctgaaaa gtattccaac gtgatattcc 300

ttgaagtaga	tgtggatgac	tgtcaggatg	ttgcttcaaa	agtgtgaagt	caaatgcatg	360
ccaacattcc	agttttttta	gaaagggaca	aaaggtgggt	gaattttctg	gagccaataa	420
ggaaaagctt	gaagccacca	ttaatgaatt	aatctaata	tgttttctga	aaacataacc	480
accattggct	atttaaaaact	tgtaatTTTT	ttaatTTTcc	aaaatttaaa	tttgaanact	540
taaccccant	tgccatntgn	gtgacaataa	aacattatgc	taccntttt	aaaaaaaaaa	600
aaaaaaaaaa	agtcttgccc	ggcggccctc	a			631

<210> 175
 <211> 261
 <212> DNA
 <213> Homo sapiens

<400> 175						
acgaacctac	agtttttaact	gtggatattg	ttacgtagec	taaggctcct	gttttgcaca	60
gccaaattta	aaactggttg	aatggatttt	tctttaactg	ccgtaattta	acttttctggg	120
ttgcctttgt	ttttggcgtg	gctgacttac	atcatgtgtt	ggggaagggc	ctgccagtt	180
gcactcaggt	gacatcctcc	agatagtgtg	gctgaggagg	cacctacact	cacctgcact	240
aacagagtgg	ccgtcctaac	c				261

<210> 176
 <211> 616
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(616)
 <223> n = A,T,C or G

<400> 176						
cgaggtaactc	tgccttttag	gagatgaggt	aagacatata	catagatggc	ttttactagc	60
caaggcaatg	taaattggact	aagattctca	tgtgacttga	ggttatctga	tgaatttatt	120
ctcttcaaaa	ccacctacct	ttagagggca	tgtttaaccc	ctctctttat	ttaaggaggg	180
agagaaaaac	acatgtaacc	agaattcaga	gtgggttact	caacctaaaga	gaacatacgg	240
agttctcttt	gggaaaacaa	caagactaca	gtgttcactt	cgcaccatga	agtggcactc	300
ctgttatggc	tgtcagagtc	ctctcacttc	ttatgaaagg	atgcatctga	ttctgaaatt	360
actgatatat	tcgatcagtt	anggatgttt	taaaaagtga	aaacaaatgc	cacacataca	420
ctttctagct	ttcttgaaat	cacccgacac	attccaaaaa	tagagaattc	cctattactt	480
ttagagaaat	ttccatatan	tcttggtnaa	gaanccagtt	gngentattc	caatttcagg	540
gtcttggttt	ttgcccacac	ccaagtgttt	ccntntttta	nggcttttca	tggccgattt	600
naaaccttnt	ttgtgg					616

<210> 177
 <211> 632
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(632)
 <223> n = A,T,C or G

<400> 177

cgaggtacag	gtcagagtct	tcttttcttt	tctttttgag	atggagtctt	gctctgttgc	60
cagactggag	tgcagtgggtg	cgatctgggc	tcactgcaat	ctccacctcc	cgggttcaag	120
cgattctcct	gcctcagcct	cccagtaac	tgggactaca	ggtgtgcgcc	accaagccca	180
gctcattttt	gtatttttag	tanagatggg	gtttcacggg	gttggctagg	atgggtctga	240
tctctggtca	gaagtctttt	ctgtaaata	ccttggtaaa	gaagcaattt	tagactgtag	300
ctggtgcaaa	tgttttaagg	aagaagcaaa	acaactgtca	gtcttcttga	aatgaaaaaa	360
ctacaccagg	gctgctatat	caaagcaacc	ccaaccagca	cttcaatcat	gatgcccaca	420
gtggccccac	tgagaaaacca	agaaaagttn	cagatacaaa	actgngatgc	tcttgctatg	480
gnaatattgc	nggcngtanc	caagttagaa	accaaacaag	cntanggcc	cgttnttttt	540
tggcgtgatt	ttggcaanaa	aaaaaactgg	gngngtgggtg	ngggttccca	ttgtaccccc	600
aaaaaacttn	gggatgggtt	aaagcccnng	gc			632

<210> 178

<211> 611

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(611)

<223> n = A,T,C or G

<400> 178

actttntttt	tttttttttt	tttttttttt	ggatttagtt	tttatttcat	aatcataaac	60
ttaactctgc	aatccagcta	ggcatgggag	ggaacaagga	aaacatggaa	cccaaaggga	120
actgcagcga	gagcacaaag	attctaggat	actgcgagca	aatgggggtg	aggggtgctc	180
tcttgagcta	canaaggaat	gatctgggtg	ttaagataaa	aaacaagtca	aacttatctg	240
agttgtccac	agtcagcaat	ggtgatcttc	ttgctgggtc	tgccattcct	ggacccaaag	300
cgctccatgg	cctccacaat	attcatgcct	tcttttcaatt	tgccaaacac	cacatgcttg	360
ccatccaacc	actcaatctt	ggcagtgag	atgaaaaact	gggaaccatt	tgtgttgggt	420
ccaacatttg	ccatggacaa	aatccangac	ccgtatgctt	taagatgaaa	ttctcatttc	480
aaatttcttc	ccataaatgg	acttgcenca	tgccatnttg	ggtgtgaagt	nccnccctgc	540
ncataaccct	ggaatatattt	tgaaacagaa	cctttttacca	atcntttttt	catgttaaaa	600
acnaaaattt	t					611

<210> 179

<211> 611

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(611)

<223> n = A,T,C or G

<400> 179

acctcaattt	tatcatttta	gagtatttgt	tagaatagga	tctctccaaa	atcaaacagg	60
atcaatctgg	tcacgtctaa	tcctaagaca	aaacactatg	taaaattttc	ctgtatctaa	120
atgttgccct	ctaggtaaat	ctgtgatatt	ttagagactt	tcttttgtgg	aaaaggtaat	180
ctgataaatg	ggaagagatc	atcagacaag	ttcacaaata	accattattt	ctgcagaatt	240
cagttgaagt	tggttttttg	taaatgctta	ttgggaattt	ctaaagcact	gacttggaga	300
ggccaagagc	ctccatcaat	ccctgcttgg	atagccactc	ccgttactac	tgctaggtca	360
gggtctacag	atgtgttggg	atctttttcca	aagaactctt	gaatgacttg	acggatccga	420

```

ggaataccaa tggagccccc aactaaaacc acctcatcaa tctcagtctt ttncaggtgg      480
ncttcttcaa tctcctgaat gggacctcgg ccgcancacn ctanggcgaa ttccacacct      540
ggcgcccgta ctaatggatc caactcgnac caacttgggg aacatggcta gtnttcnngg      600
ggaaatgttt c                                     611

```

```

<210> 180
<211> 621
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc_feature
<222> (1)...(621)
<223> n = A,T,C or G

```

```

<400> 180
acccttaaac tggcaggaca tttttgaaat cacaaatttg cacataaaga atgtcacgaa      60
cagccatgta tccatataca gcaatcaaat aaggaactta tgacctaaag caaaggtaaa      120
ctttcttgaa acttaacatt ctataccaac taggcaacct ctgcccagga tgagagttgg      180
atTTTTTcaa aacctctaatt ttaatagtgc agcatttcgt tttccctgat ggcctgtgtt      240
tcacagcagt ttttaaaaac tgcttggtca actatagctg cagcctatat cccagctatg      300
gaaaaaaaaa taaatcttag ttcaattttt gccagttgtt tctgtattta aatttaaaaa      360
aaaacacact tccgctgggc aggttttagag gggtattatc aagtctgtgc ataactaaaa      420
gttcaaagca aattcaattt tgcttaangg aacattgtna aagnacaatt cttggnanta      480
catgcctcgt tgatccattt naancatana aaattcaccc ttgtgtactg gttcaagaaa      540
aaaaccgatt tgacagttaa acatnttaaa anccccaacc tntgaagttc aaccaaactg      600
ganttttgtt cctcggcccga c                                     621

```

```

<210> 181
<211> 606
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc_feature
<222> (1)...(606)
<223> n = A,T,C or G

```

```

<400> 181
cgaggtagag accagagaca aagcaagaga agaagcagag actggtggcc cgggccgaga      60
agaaggctgc tggcaaaggg gacgtcccaa cgaanagacc acctgtcctt cgagcaggag      120
ttaacaccgt caccaccttg gtggagaaca agaaagctca nctgggtggtg attgcacacg      180
acgtggatcc catcgagctg gttgtcttct tgcttgcctt gtgtcgtaaa atggggggccc      240
cttactgcat tatcaangga aaggcaagac tgggacgtct agtccacaag gaagacctgc      300
accactgtcg ccttcacaca ggtgaactcg gaagacaaag gcgctttggc taaactgggtg      360
gaagctatca ggaccaatta caatgacnga tacnatgaga tccccctcct ggggtggcaa      420
tgtcctgggt ctaaatctgt ggcttgatn gccaaactcn aaangcaaag cttaaaaact      480
tgcncttaac tngggtnaat gtactncccg gcggccgttg aanggcaatt caacacattg      540
cggccgtcta atggntcanc ttggnccaac ttgggnaana tggnaaannn ttcttgggna      600
atttnn                                     606

```

```

<210> 182
<211> 610

```

<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(610)
<223> n = A,T,C or G

<400> 182
 ggtactcata aaaaaagtct tacccecaaaa ttgcaaacaa atacattaaa agattagaag 60
 aggtgataga aagcaccaga cattaaacaa aataaaaata ataaaataaa ttcaactcaa 120
 aagggtcccca ttccagcaaat actttgtaaa gtatggcctg tatgtaaaata gtgctaaatc 180
 aaggactttt tagcagaaaa ttgctcggtt cttttatcta aggcttgaat ttgtaaagtg 240
 aaggcataaa agttaccaaa cattaagtaa ctcttaaaat ggcacacagg ttttaaagct 300
 attgggtttt ccttctaac tctctgaatt tttcccatgg cctttgtaga tcaactatct 360
 caaacgtatt ttacaccagc aactctcaac atacttgtct ttcagatatg tcatcagtca 420
 tgtctaacag gccaatagcc aaataacnga tttaaaacaa tnccttaacta gctagcagga 480
 cattactttg gatctgctta ctgcaactga ctatttgtaa gcttaaaatc antttaatcc 540
 tgatacagaa acctcatctg cncatacatt actttggcct tcaaccttta aaaataactta 600
 atcccccgnc 610

<210> 183
<211> 608
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(608)
<223> n = A,T,C or G

<400> 183
 cgaggacttt tttttttttt tttttttttt tttttatttt tttttttttt tttttttttt 60
 tttttttggg agncagctnt ttaattaggn tcttaaaaca tttaaaacnc caatttgnga 120
 ggataaattc cattcgctcan ancaaacnca aatcgaggt anccctggan ctgaggaata 180
 nctttgattt ttggnaaaat ttgngagtcc acagctttnt gatcaatntt gcncgtctcc 240
 gnaatctcat atttctnttt ttctgngncg aaaatctcac ctctctggng tntgggcttc 300
 cgagcttnt tntttttgaa gtaagcatca ataaaangtt ttgggatttt tacattgctg 360
 aaatccattt tgggtgaagg ggcaatgaca aatttntngn gtnttctttt taaaagaacc 420
 tcattggggg ccnaaggncc cncceaaatt ataaaccctt tccccctgg tttangnaaa 480
 cccccctttg ccctgngggg nccangagga taaanaaagg ccccggggaa gctggcccca 540
 ntttttcccg ccgncgaagg gttttgccgg ctaaaanttt tngggcattt nnnnggnaat 600
 tttggctt 608

<210> 184
<211> 622
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(622)
<223> n = A,T,C or G

```

<400> 184
acagccctga tgcaaagttt cagagcatga ccagcaagtg gccagctgtg tgggtcaaga      60
tcagctccag ctgggtctgc ctectgcttt acgtctggac ccttgtggct ccacttgtcc      120
tcaccagtcg ggacttcagc tgaacctctg agtgccaagg acaccactgg aactcacaaa      180
ggtctccttc accgaaaacc catatacctt ttaagtttgt ttcaactaaa atattaagtg      240
aatgctttgc aagtttgact gtatgcaggt ttatatcaag aaggtgagat tgaataaatgc      300
ttgatgcaga atcgaaactt ctcattttat tgnatattat gtttacttct aaggatatag      360
cacaaagggg acattttttg tttaaagtga actacagctg tgctgtgaag agagtctctt      420
ataaagcctg taggtctttt aactttgggt aaaatgtaag ataggaaaaat gttggatatt      480
tgaggcntgc ctaatatatt tatattggag natcctttna aagccaaaaa aaaaaaaaaa      540
aaaaaaaaag nccttggccg gaccncccta aggggaattc cacncaactg gggccgtntt      600
atggatccaa ctcgnaacca ct                                     622

```

```

<210> 185
<211> 614
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc_feature
<222> (1)...(614)
<223> n = A,T,C or G

```

```

<400> 185
acgcgggggac agtcccaccc tcacacgatt ctttaccttt cacttcatct tgcccttcat      60
tattgcagcc ctagcagcac tccacctcct attcttgcac gaaacgggat caaacaaccc      120
cctaggaatc acctccatt ccgataaaat caccttcac ccttactaca caatcaaaga      180
cgccctcggc ttacttctct tccttctctc cttaatgaca ttaacactat tctcaccaga      240
ctccttaggc gaccagaca attataccct agccaacccc ttaaacaccc ctccccacat      300
caagcccgaa tgatatttcc tattcgccca cacaattctt cgatccgtcc taacaaacta      360
agaggcgctc ttgccctatt actatccatc ctcatcctag caataatccc atccttcata      420
tatcccaaca acaaagcata atatttcgnc cactaagcca atactttatt gattctagcc      480
ggagacctct nantntaacc tggatcggag gaaaccagta gctacccttt accaatantg      540
ganaagaaga tcgnaccttg gcgggacacc ttangggaat tcaaccactg gnggcggtat      600
atgggacccn ccng                                     614

```

```

<210> 186
<211> 627
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc_feature
<222> (1)...(627)
<223> n = A,T,C or G

```

```

<400> 186
ggtactgatt ttaaaaaacta ataaacttaaa actgccacac gcaaaaaaga aaaccaaagt      60
ggtccacaaa acatttctct ttcttcttga aggtttttacg atgcattgtt atcatthaacc      120
agtcttttac tactaaactt aaatggccaa ttgaaacaaa cagttctgag accgttcttc      180
caccactgat taagagtggg gtggcaggta ttagggataa cattcattta gccttctgag      240
ctttctgggc agacttgggt accctggcag ctccagcagc cttcttgtcc actgctttga      300

```

```

tgacacccac cgcaactgtc tgtctcatat cacgaacagc aaagcgaccc aaaggnggat 360
agtctgagaa gctctnaaca cacatgggct tgccaggaac catatnaaca atggcagcat 420
caccagactt naagaattta agggcatctt ccacttttta ccaaaacngn gaacaatctt 480
tttctttact taacnaacnt gcttccatgg gagccgggng naatccaatc aagggcataa 540
cccgggcctt atttggcnng atgggtcang gnaatanctt gaccaggaaa ccctgnttc 600
cttgggggga antttgttgn nccccac 627

```

```

<210> 187
<211> 256
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc_feature
<222> (1)...(256)
<223> n = A,T,C or G

```

```

<400> 187
ggaccttttt tttttttttt tttttttttt ggaaaagaaa ggccttacat atttattact 60
gaatccagcc aaccaacgtg ttcataacag attcagagag gaaaacacgt cgaaatctcc 120
anatagtggg gacattttca gcttgatag gtaacatgat cgtgaccttc anacagcata 180
aatatgtgtg ccattctcatg tgcaattcct tatanacca gcttggttct tctccaatgt 240
ctccttttgg agttgt 256

```

```

<210> 188
<211> 523
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc_feature
<222> (1)...(523)
<223> n = A,T,C or G

```

```

<400> 188
ggtaccacct acacccaaca agtcaatgag ggacttcttt ttaatttggt aggattttga 60
ctggttttgc aacaataggt ctattattag agtcacctat gacaaaaaat agggggtacc 120
tagataatgc caaagtcagc atttgtcctg ggttcccttg tgtgatctgt ttggactatg 180
ttttcttttc ttctcccact tgctcagcag cttgggcttc cattctagct cttttaccaa 240
gattttttgt tgaccatggt gacttcattt ggattgccct ctttcaattt ccttgtgaaa 300
acacccttaa ctttctcttt acccttagct gaaatgttta cataacttct ggtgatatct 360
tttcatgatt ttatatctct taaaatgggt atggatgtga cacctcataa aagtgagctt 420
tgaactgtag ataactctta aagaaaatgt cattttanac aattaaaata tttgtgctca 480
aaaaaaaaaa aaaaaaaaaa gtcttgcccc gcggccgctc aan 523

```

```

<210> 189
<211> 622
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc_feature
<222> (1)...(622)

```

<223> n = A,T,C or G

<400> 189

acaattttaat	ttttctgctt	gcccagaagaa	caaagcttct	gtggaacctat	ggaagaagat	60
gaaaatgaga	ctggcaaaga	acaaatgctg	aatctgaaga	agaggacaac	tttgggcaaa	120
taatctgcat	acttttaatt	gggaataaga	tggaaaatat	gaatgctaaa	tcaaattttt	180
taaaaaatac	accacacgat	acaactcaat	acaggagtat	ttcttctcaa	attcttctag	240
caccatcaac	attcttcaag	tatctgaaat	actattaatt	aagcaccttt	gtattatgaa	300
caaaacaaaa	caaggacctc	agttcatctc	tgtctagggtc	agcacctaac	aatgtggatc	360
acactcatgg	gaaagtgttt	tgaggtagtt	taaacctttt	ggaagggttg	gttttaaact	420
tccctctgtg	gaagatatca	aaagcccaaa	gtggtgccaa	atggttatgg	ttttattttt	480
caattttaat	ttgggtttct	tccaaagggtg	acatttccat	acaaggggaa	gggggtggaa	540
aaaaaatcaa	attttggggg	accagggagg	ataatnaact	gtttgcaatg	cttgacaacc	600
tttttttttt	gnccaantaa	ca				622

<210> 190

<211> 628

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1) ... (628)

<223> n = A,T,C or G

<400> 190

accactaata	gggtgtatct	cagaaactga	attgaaataa	gggaaaatag	gatttttctgt	60
cctgggtttt	gaagattggt	cttgattccc	ttgattccca	ggagagattc	tctgacattc	120
acgtgtcagc	cactttggca	cggaagcctt	acagtgtggg	gaaccacaaac	ttcgtgtctc	180
ctctttcccc	gatgccatca	gcatagactt	gacttcctta	aaccgagagt	tttgatgtgg	240
ccttggcaac	cctaaaatca	gctgtgttag	gtaacaaaac	tcaggctttc	tgttgatgac	300
atcgagatgg	tgtcacttaa	aagagccaag	attcctgttt	tcagtttggtg	gattcatcct	360
gctgggttta	ctttagtccc	tccatgtcaa	agtgggcctg	agaaaagctc	atacatgcct	420
catgtgaagt	gtccaccccc	tctgaaaatc	tttcttggtc	aaaacancna	cgacatatct	480
tggtaaactt	tacggtgact	tttggangag	gggagtttgg	aaattgtaaa	atgttatana	540
tggtgcctat	ttcctgctga	angaaatgtt	ttaaaaagnn	tntntaancn	taatcnaatg	600
gttggggggg	gaccttctac	cnaanntn				628

<210> 191

<211> 474

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1) ... (474)

<223> n = A,T,C or G

<400> 191

ggtacagccc	tcaatctggt	cttcaagctc	aagaacttca	agacagctgc	cacctttgct	60
cggcgcctac	tagaactcgg	gcccagcct	gaggtggccc	aacagacccg	aaaaatcctg	120
tctgcctgtg	agaagaatcc	cacagatgcc	taccagctca	attatgacat	gcacaacccc	180
tttgacattt	gtgctgcatc	atatcggccc	atctaccgtg	gaaagccagt	agaaaagtgt	240

ccactcagtg	gggcctgcta	ttcccctgag	ttcaaaggtc	aaatctgcag	ggtcaccaca	300
gtgacagaga	ttggcaaaga	tgtgattggt	ttaaggatca	agtcctctgc	agtttcgcta	360
aagccccctt	tgtgtgcatg	ggtcaagtca	ccatatgttc	cccccaaaaa	atgtgtctat	420
atctccttct	aacaacacct	tcccctgcac	tactcttcaa	atctngetct	ntgt	474

<210> 192

<211> 234

<212> DNA

<213> Homo sapiens

<400> 192

acgcgggggt	tggtagtggt	gctcctaccg	accgaggttt	aggcagcgcg	gggagctttg	60
cgggttgcca	tttgtaactc	cggatcctaa	aattcctgtc	ctgttctctg	tctcttctag	120
gttggggggc	gtcccgtcc	taaggcagga	agatgggtggc	cgcaaagaag	acgaaaaagt	180
cgctggagtc	gatcaactct	aggctccaac	tcgttatgaa	aagtgggaag	tacc	234

<210> 193

<211> 367

<212> DNA

<213> Homo sapiens

<400> 193

ggtaccaata	ccaccaatth	tgtagacatc	ctggagaggc	aggcgcaagg	gcttgtcagt	60
tggacgagtt	ggtggttaga	tgcagtcag	agcctcaagc	agcgtgggtc	cactggcatt	120
gccatcctta	cgggtgactt	tccatccctt	gaaccaaggc	atgttagcac	ttggctccag	180
catgttgtca	ccattccaac	cagaaattgg	cacaaatgct	actgtgtcgg	ggttgtagcc	240
aattttctta	atgtaagtgc	tgacttcctt	aacaatttcc	tcatatctct	tctggctgta	300
gggtggctca	gtggaatcca	ttttgttaac	accgacaatt	agttgtttca	caccagtggt	360
cccgcgt						367

<210> 194

<211> 613

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(613)

<223> n = A,T,C or G

<400> 194

ggtactcttg	gtttgtcaat	gggactttcc	agcaatccac	ccaagagctc	tttatcccca	60
acatcactgt	gaataatagt	ggatcctata	cgtgccaagc	ccataactca	gacactggcc	120
tcaataggac	cacagtcacg	acgatcacag	tctatgcaga	gccacccaaa	cccttcatca	180
ccagcaacaa	ctccaacccc	gtggaggatg	aggatgctgt	agccttaacc	tgtgaacctg	240
agattcagaa	cacaacctac	ctgtgggtgg	taaataatca	gagcctccgg	tcagtcccag	300
gctgcagctg	tccaatgaca	acaggacctt	cactctactc	antgtcacaa	ggaatgatgt	360
aggaccctat	gagtgtggaa	tccanaacga	attaagtgtt	gccacagcga	cccagtcatt	420
ctgaatgtcc	tctatgncca	gacgaacccc	catttccccct	cataccctan	taccgtcaag	480
gggtgaacctt	agctttctgc	atgcagcttt	aaccactgcc	agtttcttgn	tgatgatgga	540
catcacacca	cacaagactn	ttatttcaca	tactgagaan	aaagcgactt	ntactgcagg	600
cataactanc	ngg					613

<210> 195
 <211> 613
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(613)
 <223> n = A,T,C or G

<400> 195
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 ggctgtcccc accatgtcag acgcagccgt agacaccagc tccgaaatca ccaccaagga 120
 cttaaaggag aagaaggtga tggtagggaa gaggatggag atgaagatga ggaagctgag 180
 tcagctacgg gcaagcgggc agctgaagat gatgaggatg acgatgtcga taccaagaag 240
 cagaagaccg acgaggatga cttagacagca aaaaaggaaa agttaaacta aaaaaaaaaa 300
 aggcgcgcgt gacctattca ccttcactt tccgtctnaa aatctaaacg tggtcacctt 360
 caataaaaag gccccccgcc cccngggcag tgccccccca aaataaacgc gctttcacca 420
 ccaaccaaac atgaaaattt tccacaaggg anggaaaaaa aaccaaactt ccaaggcctn 480
 ttttttttta aaatactnng ccgcgaccac cctanggcga attccanacc tggcggccgt 540
 nttatggatc cnactcggac caacttgggn aatatggcat antggttctt ggngaaatgt 600
 atccccccat tcn 613

<210> 196
 <211> 296
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(296)
 <223> n = A,T,C or G

<400> 196
 gcggngggcnn ggccgacggn ctcatcaatg ttgttcggtc agcccttccc taattacacc 60
 tatccnctac acatacatgc acatagacac acnctgaac nactgaana tatttccttc 120
 aggtgtgtgtg aaaatatgct gcttgattg aaattcannt gggattgatt agncaagtan 180
 cttganacct cacagtaatc ttcacacttn nccttacaca cctatgcagg catgttgga 240
 gcangttaca atgttacttc agcccacagt ttattttctat acttgagttc ttaagt 296

<210> 197
 <211> 222
 <212> DNA
 <213> Homo sapiens

<400> 197
 acatggaggga gaatgaccag ctcaagaagg gagctgctgt tgacggaggc aagttggatg 60
 tcggggaatgc tgaggtgaag ttggaggaag agaacaggag cctgaaggct gacctgcaga 120
 agctaaagga cgagctggcc agcactaagc aaaaactaga gaaagctgaa aaccaggttc 180
 tggccatgcy gaagcagtct gagggcctca ccaaggagta cc 222

<210> 198
 <211> 539

<212> DNA

<213> Homo sapiens

<400> 198

cgaggtacta	catatttcag	cactaaggcg	gttgcttcac	tttatatcta	tataaaaaaa	60
gtggtaaaaa	tcttttcctt	ttgtgcagtt	gaacccatcc	tacattcaga	ttctctcaag	120
cactaataaa	atacttattt	ggttgaggaa	gatttaaggc	aagttcgggc	ccttccaaag	180
gcactgtgag	actccccccc	cactccccgt	tattgctaca	tgtctttata	ctcgagtatg	240
tcacagtaga	actgggtggaa	taagcaaaca	cttttttgct	agttttataaa	gttggaatta	300
gaaaagcatg	ccacatttca	gcctgattgc	aaagtatgtg	gtcatttttt	tctttgaagt	360
tggatgggct	acaaccttta	tacattctaa	gaaaactcat	aggatgttcc	tcaaactact	420
tccacagcat	caagatcgat	ttctgtcaag	aaatcatgca	atctttcaaa	atttacgtaa	480
acaaggaaa	aaattaatga	aataaatatt	acatacaatc	tcttaaatta	agaatttgt	539

<210> 199

<211> 626

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(626)

<223> n = A,T,C or G

<400> 199

cgaggtacaa	gatgtccaaa	tattgcgaag	atctatttgg	ggatctcctg	ttgaaacaag	60
cacttgaatc	acatccactt	gaaccaggca	gggctttgcc	atcccccaat	gacctcaaaa	120
gaaaaatact	cataaaaaac	aagcggctga	aacctgaagt	tgaaaaaaa	cagctggaag	180
ctttgagaag	catgatggaa	gctggagaat	ctgcctcccc	agcaaaccatc	ttagaggacg	240
ataatgaaga	ggagatcgaa	agtgtcgacc	aagaggagga	agctcacccc	gaattcaaat	300
ttggaaatga	actttctgct	gatgacttgg	gtcacaagga	agctgttgca	aatagcgta	360
agaaggcttc	agatgacctt	gaacatgaaa	acaacaaaaa	gggcctgggtc	actgtagaag	420
atgagcaggc	gtggatggca	tcttataaat	atgtagggtgc	tccactaata	tccatncata	480
tttgtccaca	atgatcaact	acgcccacct	gtaaagggttc	aagggttncat	gtggcagaag	540
aaccncatat	tcattataca	tggcttcttt	tatgaatant	cggccttggt	tcttgaancc	600
cttgcaatga	atttgnaatt	ntacca				626

<210> 200

<211> 618

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(618)

<223> n = A,T,C or G

<400> 200

actcataaaa	aaagtcttac	cccaaaattg	caaacaaata	cattaaaaga	ttagaagagg	60
tgacagaaa	caccagacat	taaacaaaat	aaaaataata	aaataaattc	aactcaaaag	120
gtccccattc	agcaaatact	ttgtaaagta	tggcctgtat	gtaaatagtg	ctaaatcaag	180
gactttttag	cagaaaattg	ctcggttctt	ttatctaagg	cttgaatttg	taaagtgaag	240
gcataaaaag	taccaaaccat	taagtaactc	ttaaaatggc	acacagggtt	taaagctatt	300

ggtttttctt	tcctaactct	ctgaattttt	cccatggcct	ttgtagatca	actatttcaa	360
acgtatttta	caccagcaac	tctcaacata	cttgtctttc	agatatgtca	tcagtcatgt	420
ctaacaggca	aatagcanaa	taacagattt	aaaacaatcc	ttactanct	agcaggacat	480
ttactttgga	ttctgcataa	ctgcaaactg	acatatttgt	aaagctaaaa	atcagtttaa	540
tcttgattac	agaaactcta	tcattgctcat	tacttaacta	ttgnccttca	atcgtatttn	600
aaattcactt	aatccaat					618

<210> 201
 <211> 627
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(627)
 <223> n = A,T,C or G

<400> 201						
ggtactaggc	acaatagaac	atacagaaaa	cattgtccct	gctcttgagg	agcttacatt	60
ctaaaagaaa	aaatacacct	tttttaaaat	ggcatttttg	tttgggtgtt	tctgcaaagt	120
acgcggggct	ttttcttttt	gaggaagacg	cggtcgtaag	ggctgaggat	ttttgggtccg	180
cacgctcctg	ctcctgactc	accgctgttc	gctctcgccg	aggaacaagt	cggtcaggaa	240
gcccgcncgc	aacagccatg	gcttttaagg	ataccggaaa	aacacccgtg	gagtcggagg	300
tggcaattca	ccgaattcga	atcacccata	caagccgcan	cgtaaaatcc	ttggaaaagg	360
tgtgtgctga	cttgataaga	ggcncanaag	aaaagaatct	canagtgaag	ggaccaagtt	420
ngaattgccta	ccaagacttt	gagaatnact	acgaganaaa	ctccttggtg	tgaagggtcta	480
agacgtgggn	tngnttccag	atgagaattc	acaagcgact	tattgacttc	acaagtcctt	540
ntgagattgt	tangctgatt	acttccttna	ntatganccn	ngaatttaag	ngggangtna	600
ccntncagan	gnttagttna	ctattttt				627

<210> 202
 <211> 620
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(620)
 <223> n = A,T,C or G

<400> 202						
actgcttaac	gaaacactat	cagcttgttt	taaatggatc	ttttaaatat	caactgtagc	60
ctggttggct	aattctttct	aattctcccc	attactttcg	cctagatttc	ccatagatca	120
acaggcatag	taaaatgcct	catcagaaca	cacttctcca	cacaattcaa	aaagggagct	180
cctgtgggct	caaagcaacc	atcagtccag	caatgcccac	gatttatctg	aaactgcttc	240
ccaagagaca	ggagtgcaga	tctgagtagc	tgtgctgcca	atacagatag	gttttagcact	300
agatatattag	tgattgtggc	aaggaagaat	cggatgatgat	gggggtggtg	ggtgaaggaa	360
gggccagggg	atctgaagga	tcttcagttg	ccttctcctg	cttcttcctc	ctgctgggtcg	420
ctcgtccana	gggtgaggtt	gtctcgcagc	aactgcatga	tcagcgtgga	gtccttatag	480
gaatcctcgt	ttagtgtgtc	cagctcagct	atggcatcat	cgaaggcttg	tttggtctaaa	540
agcangcttg	ctcangtgca	ttctggatct	catagtagaa	caccggagaa	ntgangggcca	600
ggcccaaccg	gatnggatgc					620

<210> 203
 <211> 577
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(577)
 <223> n = A,T,C or G

<400> 203
 ggtacttttt tttttttttt tttttttttt tttttttttt tttttttttt tgaaaaagtc 60
 atggaggcca tgggggttggc ttgaaaccag ctttggggggg ttcgattcct tccttttttg 120
 tctaaatttt atgtatacgg gttcttcnaa tgtgtggttag ggtggggggc atccatatag 180
 tcaactccagg tttatggagg gttcttctac tattaggact tttcgcttcn aagcgaaggc 240
 ttctcaaate atgaaaatta ttaataattac tgctgttaga naaatgaatg ancctacaga 300
 tgataggatg tttcatgtgg ggtatgcacg ggggtantcc gagtaacgtc ggggcattcc 360
 ggataggccn agaaagtgtt ntgggaanaa agttagattt accccgatga atatgatagt 420
 gaaatggatt ttggcgtagg tttggcttag ggtgtancct gagaataggg gaaatccgtg 480
 aatgaaacct cctatgatgg caaatacact cctattgnta ggacataatg ngaagtgagc 540
 tacaaccgta atacctgccc nggcnggccc ttannan 577

<210> 204
 <211> 629
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(629)
 <223> n = A,T,C or G

<400> 204
 cgaggtagct gttttttttt ttttttttga gacggagtcct cagtctgtca cccaggctag 60
 agtgacagtgg cagcagatcg gctcactgca acctccgcct cccgggttca agtgattctc 120
 ctgcctcaac ctcccagta gctgggacta caggcatgtg ccaccacgcc tgactaattt 180
 ttgtattttt agtanagatg ggatttcatt atggtggcca gctgggtctg aacttctgag 240
 ctccaggtgat ccaccgcct tagcctncca gaggcttagg ataacaggca tgagccgtcg 300
 cgccctggcca aaatagcata atgttttaag aaagtttacg aatttgtctt gggccacatt 360
 naaaaccatc atggggccaag gggtggacaa gctagcctta ggtcatgtca gaatgcaatt 420
 taacaggaat ttcaagcnaa acttacaaaa aattaaatcc acaaaaaaaaa tatcatttgg 480
 taaatgcact gnetacacac tttactncta agtccattca accatgacga ccctttacat 540
 aaaaattagg gcattctccc aagttctaaa gatgatttct aaaacattac caangnctaa 600
 agtctaattc ccacaaanct tttttttt 629

<210> 205
 <211> 424
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(424)

<223> n = A,T,C or G

<400> 205

ggtacaaatg	cttttatatt	cagcccctgt	aaagccatca	gatgtttgaa	agttttttaa	60
cacgaaccaa	agggttta	tttaagaact	tagctaggaa	tgggtgaaat	cctacccaat	120
taatagagtt	ctgcaaatta	gtaacaaagt	gtaaaatgaa	aggaagggtc	ccttgagat	180
gtgaaattct	tctattgaga	gtcctgtctt	ctttattcaa	gaagtttgta	gccattttca	240
gaattcactc	aagaaccaac	ttcttaattt	agatatcagc	gaacaagtca	tggcaaaaaa	300
tacacaaaga	gaaacaccac	cacatcgaaa	aggatgaaaa	gccagagggtc	caaccagtan	360
gagtgtttgg	gaagcccatt	tgccccagac	tgaggcctca	catcgaagtt	ctgcctcccc	420
gcgt						424

<210> 206

<211> 633

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(633)

<223> n = A,T,C or G

<400> 206

ggtaccaatg	gtgcctcctg	gaatcaagta	tctttacctt	aggaataacc	agattgacca	60
tattgatgaa	aaggcctttg	agaatgtaac	tgatctgcag	tggctcattc	tagatcacia	120
ccttctagaa	aactccaaga	taaaaggagg	agttttctct	aaattgaaac	aactgaagaa	180
gctgcatata	aaccacaaca	acctgacaga	gtctgtgggc	ccacttccca	aatctctgga	240
ggatctgcag	cttactcata	acaagatcac	aaagctgggc	tcttttgaag	gatttggtaaa	300
cctgaccttc	atccatctcc	agcacaatcg	gctgaaagag	gatgctgttt	cagctgcttt	360
taaaggctct	aatcactcgc	aataccttga	cttgagcttc	aatcagatag	ccagactgcc	420
ttctggcttc	cctgtctctc	ttctaactct	ctacttagac	aacaataaga	tcagcaacat	480
ccctgatgaa	gtatttcaag	cgtttaatgc	tttgagtat	ctgcgtttat	ctcacaacga	540
actggctgat	agtggaatac	ctggaaattc	tttcaatggn	gccatcctgg	gtgaacctgg	600
acttgcctat	accagcntaa	aacataccac	cgg			633

<210> 207

<211> 623

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(623)

<223> n = A,T,C or G

<400> 207

ggtacttttt	tttttttttt	tttttttttt	ttagaaacta	tggctctttta	ttttcatgtg	60
gataattcaa	acaaagtcac	tagtagtctt	tgttcaattt	tttttttaaaa	aacaaaaaaa	120
ccctcaaata	aaaaatcttg	ggcttaaaaag	aactctatca	caggagcctg	gttgaggat	180
tcttagtttt	atacatgaga	aatagaatgc	agattttctt	gaagagtgtt	taaagaagga	240
atggtagttg	agggggctta	tttcccaggc	tcaaagtgat	ttaggggtgg	tgtcacagtg	300
ctaggtatag	ggtgatggac	agtgatcact	gccgagggcc	ttggaacgga	tcttgctgtc	360
acacaatgca	ggtaacagag	agtgggacaa	caaaaagtaa	tcaaggcgcc	aaccaacatt	420

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cttggatcga gcattcatat ataagtccea aagggtgtang cataaggtgt gttgggggtan 480
aagtgcctaa agctgcaacc agtggcacan cctgcagtaa ttccccgaac cttggccttt 540
tggggctga anccnccatt cttttggtnc cctnggggtg cnaaggcaat tttttnatgtg 600
cccattgagg gttcaaacac aca 623

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<210> 208
<211> 620
<212> DNA
<213> Homo sapiens

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<220>
<221> misc_feature
<222> (1)...(620)
<223> n = A,T,C or G

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<400> 208
acgatgtcta gtgatgagtt tgctaataca atgccagtcg ggcacacctac ggtgaaaaga 60
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gtggcgagtc agctaaatac ttgacgcgcg gtggggatag cgatgattat ggtagcggag 180
gtgaaatatg ccccgcgtag ttgctttgaa agattaccta ctattttatg ataaaatgta 240
gttgtctcca gagcttaaat ataatttgta aagcacttgg tttaaatttc tctctacct 300
taaacagttt agcattaagg gtttctatta atgacacaga attattggcc aagtgttaatt 360
tcttaaaatt tagcattact ttaaataagg agcatgtaac acaagtaact acactacctc 420
atatctacat gattttcaag ttgtaatgca gatggacaga taaaaaagat ttacgttgnc 480
ttttggccat aagtgggaaa agttttctgn atattgcata gcattacaca tttatgccta 540
ttttacatta acttctaagg aagtttttct aagaaaangg ttcaggcaat attttttgag 600
gctgccgaan aaaaatgant 620

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<210> 209
<211> 624
<212> DNA
<213> Homo sapiens

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<220>
<221> misc_feature
<222> (1)...(624)
<223> n = A,T,C or G

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<400> 209
ggtactggta caaaaacagg cacataaacc aatgaaacag aatagaaagc ccagaaataa 60
tgcttcaccc ccacaacccat ctgatcttca acaaaaataa caaaaacgag ccatggggaa 120
aggactccct attcaataaa tgggtgctggg ataactagtt aaccatatgc agaagattaa 180
agctggaccc ctctcttaca aaataaggag ctggacccct tatacaaaaa tcaactcaag 240
atggattaaa gcctttaaag tgaaactata aaaccctgga agacaacata ggcgattcca 300
ttctagacat cagaactggc aaagatttca tgaggaagac accaaaagca attgcaacaa 360
aagcaaaaat tgacaactgg gatataatta agtttaagag cttctgcaca gcaaaagaga 420
gactatcagc agagtaaaca gaccacctac agaattggag aaaatatttg caaactatgc 480
atgtgacaaa ggtctaatat ctagcatcta taagtactta aacaaatttc aacagaaaac 540
caacacccca ttaaaaagtg ggcaaggaca tgaacaaatg cttttcaaaa gaagacatct 600
gcttntacag tttntgaaac aaag 624

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<210> 210
<211> 504

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<212> DNA

<213> Homo sapiens

<400> 210

acgcgggggca	gctagcagat	gcttttaggac	ctagtatctg	catgctgaag	actcatgtag	60
atattttgaa	tgattttact	ctggatgtga	tgaaggagtt	gataactctg	gcaaaatgcc	120
atgagttctt	gatatttgaa	gaccggaagt	ttgcagatat	aggaaacaca	gtgaaaaagc	180
agtatgaagg	aggatatctt	aaaatagctt	cctgggcaga	tctagtaaat	gctcacgtgg	240
tgccaggctc	aggagtgtg	aaaggcctgc	aagaagtggg	cctgcctttg	catcgggggt	300
gcctccttat	tgcggaatg	agctccaccg	gctccctggc	cactggggac	tacactagag	360
cagcggttag	aatggctgag	gagcactctg	aatttgttgt	tggttttatt	tctggctccc	420
gagtaagcat	gaaaccagaa	tttcttctact	tgactccagg	agttcagttg	gaagcaggag	480
gagataatct	tgccaacag	tacc				504

<210> 211

<211> 619

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(619)

<223> n = A,T,C or G

<400> 211

accatgaaat	atccagaaca	tacttatatg	taaagtatta	tttatttgaa	tccacaaaaa	60
acaacaaata	atttttaaat	ataaggattt	tcctagatat	tgacgaggag	aatatacaaa	120
tagcaaaatt	gaggccaagg	gccaagagaa	tatccgaact	ttaatttcag	gaattgaatg	180
ggttttgctag	aatgtgatat	ttgaagcatc	acataaaaaat	gatgggacaa	taaattttgc	240
cataaagtca	aatttagctg	gaaatcctgg	atttttttct	gttaaactctg	gcaaccctag	300
tctgctagcc	aggatccaca	agtccttggt	ccactgtgcc	ttggtttctc	ctttattttct	360
aagtggaaaa	agtattagcc	accatcttac	ctcacagtga	tgttgtgagg	acatgtggaa	420
gcactttaag	ttttttcatc	ataacataaa	ttattttcaa	gtgtaactta	ttaacctatt	480
tattatttat	gnattttatt	aagcatcaaa	tatttgtgca	agaatttgga	aaaatagaag	540
atgaatcatt	gattgaatag	tattaagatg	tatagtaaat	tattttattt	ananattaaa	600
ngangtttat	taganaaan					619

<210> 212

<211> 479

<212> DNA

<213> Homo sapiens

<400> 212

cgaggtacaa	agcagcaact	gcaatactca	aggttaaaac	attagaaaag	catttgtgtg	60
acaggtatat	tacagtatta	tcaaaatatt	acattttcag	acttacttag	cagataatca	120
tccaccagag	cttaaatctt	taaattatct	ccatagtctt	aaaaaatatg	taatgtcaga	180
atgcatataa	aaagaatgta	aaaggaaacc	taaaatacaa	atggaataat	gtaacaaata	240
aatatttgat	ttcagtaact	gttaataatc	agctcaacac	caccattctc	tctaaactca	300
atttaattct	tataggaata	atgaactgtc	aaatgccatg	gcataattat	ttatttccaa	360
gctatcatca	atgattagaa	ctaaaaaaat	tttggcataa	aaaaatcaca	attcagcata	420
aataaagcta	tttttagctt	caacactagc	tagcatctct	aagaattgtt	gaaataagt	479

<210> 213

<211> 487
 <212> DNA
 <213> Homo sapiens

<400> 213
 actgtttact gcctgggcac tatactttct atgcagatct cctttgtggg tttccagcct 60
 gtcctttcat cagagcacat ggcagccttt ggggtctttg gtctctgcca gatccatgcc 120
 tttgtggatt acctgcgcag caagtgaat ccacaacaat ttgaagttct tttccggagc 180
 gtcattctctc tggtaggctt tgtccttctc accgtgggag ctctcctcat gctgacagga 240
 aaaatatctc cctggacggg gcgtttctac tctactgctgg atccctctta tgctaagaac 300
 aacatcccca tcattgcttc tgtgtctgag catcagccca caacctgggc ctcatatctat 360
 tttgacctgc agctcctcgt cttcatgttt ccagttggcc tctattactg ctttagcaac 420
 ctgtctgatg cccggatttt tatcatcatg tatggtgtga ccagcatgta cctcggccgc 480
 gacacgc 487

<210> 214
 <211> 393
 <212> DNA
 <213> Homo sapiens

<400> 214
 cgaggtaaaa tatgctgcag cataatattgt caggccaacc ttcacaccat attttggcag 60
 ttcgtgtgca tacgctgcgc agactatcat atccccctct atacgggcat aagcaatctg 120
 acaaatgata tctctgtttg tcacacgaac tatcactctg tatttgggtg tgttgtattt 180
 atttttatct tgtatcacca agcgtttccg agcataataa tcagttttac cctctcgtcg 240
 tcttctaaat ttcacttggg atctcttaaa gtaggcctta ttcttaacaa ctttaacaaa 300
 ccccatcctg cggaacagag accggcgctc gctgctcgac agagacctgc aggcccagcg 360
 gcgctagggg gtgggaaaaa ggccaccccc cgt 393

<210> 215
 <211> 615
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(615)
 <223> n = A,T,C or G

<400> 215
 ggtacagtaa caagtgttgg cattatcagt tgaactgtaa atacaaaatg cttcttccaa 60
 ttagtctcta tgatgattaa gtttctaaaa tttatctgaa caccattcag aaacttgttt 120
 tggggaattt gatagttatt gatgtgcac tgttaaactg atgacagaca taactcatca 180
 ttccccagaa accttttttg attacagtat ctaacatttt gcctcctctt ttttggtttt 240
 gctggttata aaggtttggg ttggagaggg ctactggat cccaatcctt ggagctggat 300
 cattggattc aaatcataat gtggatagga tagggaggat gaattaccag gattcatgga 360
 gcgggatcag attaccagga acataggagt ggattcctgc ccaaccaaac ccgattcgt 420
 gtggattttt ttattcaact taattggcta ttccaaagat ttttttttcc tatttttgac 480
 gaatggagcc cttaagatgc acgatggaat tgggtttgcg tttttggtaa aaggacaaa 540
 ccaggcctgg agataacgct ggagcaatct cntggaagga ttagccccaa ttgatgggaa 600
 catttaangg ggaag 615

<210> 216

<211> 322
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(322)
 <223> n = A,T,C or G

<400> 216
 ggtacttttt tttttttttt tttttttttt ttttttggag ttgtaggcaa atgtttaatt 60
 aattctgctc atatgcacat ctgaaagcat gagacacact ccacagacag cacgcactgg 120
 ggctgggtgg gcanatgggc actcgccgat taggtattaa tgtcaataat acgtgcataa 180
 agtgctgata aaataactta agtgttacaa aaagagacag tccacgggtg ctgcaggcac 240
 atgcaggcgg gactgggtca aacactccag ggctgcacat gttccagctg gcctgagtcc 300
 gacacgtcat aactggcctt gt 322

<210> 217
 <211> 606
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(606)
 <223> n = A,T,C or G

<400> 217
 acgcgggggg aagtgagcga cacactctgc gtcctcgccct caccagagtc ttgctgtgtg 60
 gccaggctg gagtgcccg ctggtctcaa attcctgacc tcaagtgatc tccctcccaa 120
 agtggttgcga ttgcagggtg gagccactgc acctggctgc tgagaaatct ttgcctacag 180
 tgagggaac tactaaagt cctggggaag caaagtaaga atttcataag aacaaaatgg 240
 atggagagga gaaaacctat ggtggctgtg aaggacctga tgccatgtat gtcaaattga 300
 tatcatctga tggccatgaa ttattgttaa aaagagaaca tgcattaaca tcaggcacga 360
 taaaagccat gttgagtggc ccaagtcaat ttgctganaa cgaaaccaat gaggncaatt 420
 ttagagagat ccttcacatg tgctatcgaa agtattcatg nattttacgt accttgggcc 480
 gcgaccacct taaggccaat tncacacact ggcnggccgt actantggat ccnactngga 540
 ccaacttggc gtaatcatgg catactggtt cctggggaaa atgtatccgt tacaattcnc 600
 acacan 606

<210> 218
 <211> 618
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(618)
 <223> n = A,T,C or G

<400> 218
 ggtacttttt tttttttttt ttttttttga gacggagtgt ggcccttggt gccaggctg 60
 aagtgaata gtgcgatctc ggctcactgc aacctccacc ttccgtgttc aaccgattct 120

cctgcctcag	cctcctgagt	agctgggatt	acagatgaaa	aaacatttaa	agcccttaag	180
gaagaaggaa	atcaatgtgt	aaatgacaaa	aactataaag	acgccctcag	taaatacagc	240
gaatgcttaa	agattaacaa	taaggaaatgt	gccatatata	caaacagagc	tctctgttac	300
ttgaagctgt	gccagtttga	agaagcaaaag	caggactgtg	atcaggcact	tcagctagct	360
gatgggaacg	tgaagcctt	ctatagacga	actctggctc	ataaaggact	caagaattat	420
cagaaaagct	taattgatct	caataaaagt	atcctactag	atccaagtat	tattgaggca	480
aagatggaac	tggaagangt	aactagactc	ctaactctaa	ggataagaca	gcaccattca	540
acaaagaaaa	ggagagaagg	aaaatgagaa	tcaagaggng	aatgaaggca	ngaggancct	600
ggaaaacctg	aggggagg					618

<210> 219

<211> 613

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(613)

<223> n = A,T,C or G

<400> 219

ggtacaaagc	ggatctgagc	ccggaaaaatg	ctaagctcct	cagcacattc	ctaaatcaga	60
ctggcctaga	cgcttctctg	ctagagctgc	acgaaatgat	aatcttgaaa	ctaaagaacc	120
cccaaaccga	aaccgaggag	cgcttccgcc	ctcagtggag	cctgagagac	actctcgtaa	180
gttacatgca	aactaaagaa	agtgaatctc	ttcctgaaat	ggatatctcag	ttcccagaag	240
agatactgct	cgccagctgt	gtctcagtgt	ggaaaacagc	tgctgtgctg	aaatggaatc	300
gagaaatgag	atagaattat	ttcctcagct	atctttggat	gactttggag	agaagactcc	360
tctctcctcg	tctgcccgtg	ggacttgatc	atggactggg	gcctttgcat	tcagaaggag	420
agctgtcagc	gtagaccgga	attcaagacc	aaggcgtgct	acctgagctg	acagcttttt	480
gaaagccgag	ctggttctga	accatgtcct	gcccnggcng	gcgctcgaaa	gggcgaattc	540
agccactggc	ggccgtacta	ntggatccga	actcggacca	aacttggcgt	aatatgggca	600
tactggttcc	tgg					613

<210> 220

<211> 616

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(616)

<223> n = A,T,C or G

<400> 220

ggtacgcggg	ggcagccgag	gtgtttgtgt	gtggggaagg	gagaaggatt	tgtaaacccc	60
ggagcgaggt	tctgcttacc	cgaggccgct	gctgtgcgga	gacccccggg	tgaagccacc	120
gtcatcatgt	ctgaccagga	ggcaaaaacct	tcaactgagg	acttggggga	taagaaggaa	180
ggtgaatata	ttaaactcaa	agtcattgga	caggatagca	gtgagattca	cttcaaagtg	240
aaaatgacaa	cacatctcaa	gaaactcaaa	gaatcatact	gtcaaagaca	gggtgttcca	300
atgaattcac	ctaggtttct	ctttgagggg	cagagaattg	ctgataatca	tactccaaaa	360
gaactgggaa	tggaggaaga	agatgtgatt	gaaagtttat	cangaacaaa	ccgggggtca	420
ttcaacagtt	tanatatctt	ttttaatnnt	ttcttttncc	tcaatccttt	tttattttta	480
aaaatagttc	ttttgtaatg	tgggtgtcaaa	acggaattga	aaactggcac	cccatctttt	540

gaaacatctg gtaatttgaa tctaattgctc attatcatta tgggttggtt cattggcnga 600
 attttggga tcaanc 616

<210> 221
 <211> 615
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(615)
 <223> n = A,T,C or G

<400> 221
 ggtacagtga tagctccccc tgggcaatac aatacaagaa cagtggggtt tgtcaaattg 60
 gaacaaggaa acagaaccac agaaataaat acattgggta acatcagatt agttcagggt 120
 acttttttgt aaaagttaaa gtagagggga cttctgtatt atgctaactc aagtagactg 180
 gaatctcctg tgttcttttt tttttaaaatt gggttttaatt ttttttaatt ggatctatct 240
 tcttccttaa catcttcagtt ggagtatgta gcatttagca ccactggctc aatgcgctca 300
 cctagggtgag agtgtgacca aatcttaaag cattagtgtc attatcagtt accaccattt 360
 ggggctttta tccttcattgg gttatgatgc tctcctgatg acacatttct ctgagttttg 420
 taattccagc caaagagaga ccattcacta tttgatggct ggctgcatgc agacatttaa 480
 agctttttaga gaatacacta caccagggag tatgactact antatgacta ttagganggt 540
 aatacccaga attggactcg caccttaggc aagatccaac cactaaattg aataagaatg 600
 agtngatgag gtncc 615

<210> 222
 <211> 617
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(617)
 <223> n = A,T,C or G

<400> 222
 ggtacttttt tttttttttt tttttttttt ttttaattta tgattttatt gnccttcctt 60
 tgtccggcct ttaacatggt tctgtaattt aaataaaaat ctatttactt tctccatttt 120
 agcaaatggt ttctttaccc aaatagggtg cactatagtc cccatatggt tttctactgn 180
 tccacaacca ctatttcaca aagattgaca aaactttaat aaaagttaaa tttacagaca 240
 tcttaagata acttgggaaa tatgtagtaa aaaagaatcg agtccacaaa ttaagaatat 300
 tttgctaata tgcccaacac caatttcagc aaatccaatc tacttaactc atatatattaa 360
 tngggtaatt tttctaacia aatttaaatgg gggtatgaat gatatatatta tgcccttgac 420
 aaagatgaca tgtgtgattt tgggtngact aanaaaggag aagtatgatt tctggnggggt 480
 atganatcac tctggctcat cgaagctcca gaatatgtaa gggctcgnca cgtccaaaaa 540
 tgttaggcna atgtataaaa ggccacccgg ctnacacacg ttttatatac aaactttngn 600
 agtcctttta tntcata 617

<210> 223
 <211> 470
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1) ... (470)
 <223> n = A,T,C or G

<400> 223
 ggtaccacaa ctgtgccctt gataattagt aatcactcct aaaaatcttc atttggcacc 60
 agatgggtgtg tttaaaacac cctaggatgt tttgaatcag gcttgatttt gttagttgag 120
 ttacaggaga atttttaagg tgaggggtatg ggggtcaggg aagaaaagga aatgggaaat 180
 ggaccagaaa aaatcttgag tcatcatcta aatcaacaaa gcactgatag ctccaaatat 240
 taggtcagac actaaaacga ctgatatagg ctcaagtggg ttataaaaacc tataaaaaga 300
 ctacaccagc aaagtccctg tcaatctgtc agagttcaga aactaaaaca gggagtaaca 360
 ttttagctta aaaccttatc tcaagagaat catatacact tcacatgaat aaaaatacct 420
 gaaaccaaac atttttaaaa gctccagtcc tgcccnnggc ggccgctcga 470

<210> 224
 <211> 622
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1) ... (622)
 <223> n = A,T,C or G

<400> 224
 gcgtggncgc ggccgacgtn ctcttttttt tttttttttt ttttttgcnn actaaaaaatn 60
 ngattgctct ttaaagcctt aggccgnatg acaaaatgan nagactgaaa tgacancggg 120
 gaggaagaaa cagannaaag ataagaatga ggtggtcagg ttgggggaat taagcgaata 180
 ttcncttcen nggtgagtc tncactggg ctcatgccca tgatgagttg cacaccaaac 240
 acnggctgnt gacttncctc ctgcnctant cagtgaactt gcngacatng ggnancctca 300
 cattacagnt ataanttttc cacctaaaaa atgctgcgct tttcgacnng ctcnnncagn 360
 ggccgggggt tgacatggng gaanggattt ctctcccatg ccaaggaatt catcacatca 420
 ctgntactcc actgncaacc ttntccattg ggctcngtgc cctgtgtngg gtcatggacc 480
 cantccanaa ntatgaatac tgtaccatgc tcttaaccag gaggacctaa ggatccttag 540
 ncccntgagn nanacaccag gnttcaaagg ccgttttggg aagccaaatt tgnttnggnc 600
 cgaattnggg ccaaacangg tt 622

<210> 225
 <211> 619
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1) ... (619)
 <223> n = A,T,C or G

<400> 225
 acgcgggggag ttccgccatg gcctccttgg aagtcagtcg tagtcctcgc aggtctcggc 60
 gggagctgga agtgccgagt ccacgacaga acaaatattc ggtgctttta cctacctaca 120
 acgagcgcga gaacctgccg ctcatcgtgt ggctgctggt gaaaagcttc tccgagagt 180

gaatcaacta	tgaaattata	atcatagatg	atggaagccc	agatggaaca	agggatgttg	240
ctgaacagtt	ggagaagatc	tatgggtcag	acagaattct	tctaagacca	cgagagaaaa	300
agttgggact	aggaactgca	tatattcatg	gaatgaaaca	tgccacagga	aactacatca	360
ttattatgga	tgctgatctc	tcacaccatc	caaaatttat	tctgaattt	attagcccg	420
ggggccaatt	ttttaactca	natcttgctg	agaccaggag	catctgattt	aacaggaagt	480
ttcagattat	acccgaaaaa	gaagttctag	agaaattaat	agaaaaatgt	ggttctaaag	540
gctacgtctt	ncaaattggag	atgattggtc	nggcaagaca	gttgaatatt	ctattggcga	600
ggttccatat	canttgngg					619

<210> 226

<211> 277

<212> DNA

<213> Homo sapiens

<400> 226

acgcggggcc	cctcatTTac	ataaatatta	tactagcatt	taccatctca	cttctaggaa	60
tactagtata	tcgctcacac	ctcatatcct	ccctactatg	cctagaagga	ataatactat	120
cgctgttcat	tatagctact	ctcataaccc	tcaacaccca	ctccctctta	gccaatattg	180
tgcttattgc	catactagtc	tttgccgcct	gcgaagcagc	ggggggccta	gccctactag	240
tctcaatctc	caacacatat	ggcctagact	acgtacc			277

<210> 227

<211> 328

<212> DNA

<213> Homo sapiens

<400> 227

ggtacatatt	tttgccaatg	ctatacagca	aaaatgaaaa	acttacagaa	aggtaaacia	60
aattgagtc	acttttttaa	tttcacaagc	tgcttttaaac	tatagaacca	ccagatatct	120
gtaaaataag	caaaactggt	aagtgtgttt	ttttaattga	gggaaggagg	gccagaggag	180
ttggtgcaga	agcgcttcg	gtgaattcat	accagagcca	ccgggtgtga	ctcggtacc	240
tctcccaatt	accacaggg	ggtcttaaaa	ttgaatttca	gtttcagcag	atactccaga	300
tttacctgag	caatatcata	gacaatgt				328

<210> 228

<211> 609

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1) ... (609)

<223> n = A,T,C or G

<400> 228

acgcgggagt	tcaagcagat	gtatggctaa	ccggaaacag	gtgggtcacc	tcttgcaaga	60
agtggggcct	cgagctgtca	gtcatcatgg	tgctatcctc	tgaaccctc	agctgccact	120
gcaacagtgg	gcttaagggt	gtctgagcag	gagaggaaa	ataagctctt	cgtggtgcc	180
acgatgctca	ggtttggtaa	cccgggagtg	ttcccagggtg	gccttagaaa	gcaaagcttg	240
taactggcaa	gggatgatgt	cagattcagc	ccaagggttc	tcctctccta	ccaagcagga	300
ggccaggaac	ttctttggac	ttggaagggtg	tgcggggact	ggccgaggcc	cctgcacct	360
gcgcacag	actgcttcat	cgtcttggt	gagaaaggga	aaagacacac	aagtcgcgtg	420
ggttgagaaa	gccagancca	ttccacctcc	cttccccaac	atctctcana	gatgtgaaac	480

cagatctcat	ggcaacnaag	ccctntgcaa	gaagctcaag	gaanctaagg	aaaatggacg	540
ttttcagana	atggttgtag	ttcatgggtt	ttncctactg	ccgggtcctt	tcttangacc	600
cgcanaant						609

<210> 229
 <211> 610
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(610)
 <223> n = A,T,C or G

<400> 229						
ggtacttttt	tttttttttt	tttttttttt	gcagactaaa	aattttattg	ctcttttaaag	60
ccttaggccg	tatgacaaaa	tgaagagact	gaaatgacag	cggggaggaa	gaaacagaag	120
aaagataaga	atgaggtggt	caggttgggg	gaattaagcg	aatattctct	tccaggggtga	180
gtcctcacac	tggtctcatg	cccatgatga	gttgacacac	aaacacaggc	tgctgacttc	240
cctcctgcac	tagtcagtga	acttgcagac	atagggtaac	ctcacattac	agttataatc	300
tttccacctc	agaaatgctg	tgcttctcga	caggctcgca	cagtggccgg	ggcttganat	360
ggtggaggga	tttctctccc	atgcaaagta	attcatcaca	tactgntac	tccactccca	420
accttctcca	ttgggctcgg	tgccctgtgt	ggggtcatgg	acccaatcca	acgtatgant	480
actggtacca	atgctnttac	cagggaggac	acnaaaggat	cccttacccc	ctgagcacag	540
acccnagggt	tcaaanggcc	gttttggcag	gccaaactgn	atntgnccag	aatttgngna	600
caaaacaagg						610

<210> 230
 <211> 346
 <212> DNA
 <213> Homo sapiens

<400> 230						
ggtcggccga	ggtaccatgc	actgagtgac	tgtggggatc	atgttggtat	aatgaacaca	60
agacacattg	cattttctgg	aaacaaatgg	gaacaaaaag	tatactcttc	gcatactggc	120
taccaggtg	gatttagaca	agtaacagct	gctcagcttc	acctgagga	tccagtggca	180
attgtaaaac	tagctattta	tggtcatgctg	ccaaaaaacc	ttcacagaag	aacaatgatg	240
gaaagggtgc	atctttttcc	agatgagtat	attccagaag	atattcttaa	gaatttagta	300
gaggagcttc	ctcaaccacg	aaaaatacct	aaacgtctag	atgagt		346

<210> 231
 <211> 601
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(601)
 <223> n = A,T,C or G

<400> 231						
ggtacgcggg	gagagcacat	ccggtgttag	aagcgctggg	aggccttgga	gaggcgggtt	60
aggaagagtg	gagactgctg	cacggactct	ggaaccatga	acataattga	tcgaaagatc	120

```

aactttgatg cgctttttaa atttttctcat ataaccccg t caacgcagca gcacctgaag 180
aaggtctatg caagttttgc cttttgtatg tttgtggcgg ctgcaggggc ctatgtccat 240
atggctactc atttcattca ggctggcctg ctgtctgcct tgggctccct gatattgatg 300
atttggtcga tggcaacacc tcatagccat gaaactgaac agaaaagact gggacttctt 360
gctggatttg cattccttac aggagtggc ctgggcccctg cctggagttt tgnattgctg 420
tcaacccac atccttccac tgctttcatg ggcccgaat gatctttacc tgcttaacct 480
taatgcactc tatccaagcg ccgtactcct tttctgggag gatcttgatg tcagcctgaa 540
cttgtgcttt gcttcctggg gaatgtttct ttggatccat tggcttttca gcnaactttt 600
t 601

```

```

<210> 232
<211> 390
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc_feature
<222> (1) ... (390)
<223> n = A,T,C or G

```

```

<400> 232
actttttttt tttttttttt tttttttttt ttggtttttaa tgtttatttc cccaagacag 60
cctagcctgc actctacttg gataaatttt acaagctagt tttctgctgc ttctagtttt 120
aaactttaac catgtttctg atgacaagga atgctgcaaa aatactctag ttcaacaaag 180
agttatgac acaaaataat ttttatccat tctacagtgt ttcanaatta ccagttgatt 240
tttaaacaca aagtagatat agatgctaata ggtggctaata ctggtatgtt tcttatagca 300
aactgttggt catgcaacac ttgtgctcaa aggggaaggc acaggatttc ctacaatgag 360
ccaccttata aagagtctct tttgnacctn 390

```

```

<210> 233
<211> 603
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc_feature
<222> (1) ... (603)
<223> n = A,T,C or G

```

```

<400> 233
cgaggtacgc gggggaagag tgagggttcc aacttttctg cttatctggg aggtgttggg 60
cgcgacaat cgagatgtca gagaaaaagc agccggtaga cttaggtctg ttagaggaag 120
acgacgagtt tgaagagttc cctgccgaag actgggctgg cttagatgaa gatgaagatg 180
cacatgtctg ggaggataat tgggatgatg acaatgtaga ggatgacttc tctaatacagt 240
tacgagctga actagagaaa catggttata agatggagac ttcatagcac ccagaagaag 300
tgttgaagta acctaaactt gacctgctta atacattcta gggcagagaa cccaggatgg 360
gacactaaaa aaatgtgttt atttcattat ctgcttggat ttatttgtgt ttttgtaaca 420
caaaaaataa atggtttgat ataagaaaaa annnnnnnna aaaaaaaagt nctggccngg 480
cggcgttca aanggccaat tccaccact ggccggccgta ctaanggacc aacttggnc 540
aacttgggga atcanggcaa actggttcct gngaaatgg nttcccttcc aattccccaa 600
atn 603

```

```

<210> 234

```

<211> 616
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1) ... (616)
 <223> n = A,T,C or G

<400> 234

cgaggtacct	tcattgcat	caaaccagat	gggggtccagc	gggggtcttgt	gggagagatt	60
atcaagcgtt	ttgagcagaa	aggattccgc	cttggttggtc	tgaaattcat	gcaagcttcc	120
gaagatcttc	tcaaggaaca	ctacgttgac	ctgaaggacc	gtccattctt	tgccggcctg	180
gtgaaataca	tgcactcagg	gccggtagtt	gccatgggtc	gggaggggct	gaatgtggtg	240
aagacggggc	gagtcattgt	cggggagacc	aaccctgcag	actccaagcc	tgggaccatc	300
cgtggagact	tctgcataca	agttggcagg	aacattatac	atggcagtga	ttctgtggag	360
agtgcagaga	aggagatcgg	cttgtggttt	caccctgagg	aactggtaga	ttacacgaac	420
tgtgctcana	actggatcta	tgaatgacag	gaaggcagac	ccattgnttt	tcacatncat	480
ttcccttcnt	tccattgggc	aaaggaccag	ctttnggaaa	tctantnttt	accnggacct	540
tattcttaat	ttgganggaa	actnttggac	tttgangtnt	tcctntacct	ngcccgggng	600
gccgtttaaa	agggna					616

<210> 235
 <211> 607
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1) ... (607)
 <223> n = A,T,C or G

<400> 235

acgcggggag	tgcgttactt	acctcgactc	ttagcttgtc	ggggacggta	accgggaccc	60
gggtgtctgct	cctgtgcctt	tcgcctccta	atccctagcc	actatgcgtg	agtgcatttc	120
catccacggt	ggccaggctg	gtgtccagat	tggcaatgcc	tgctgggagc	tctactgcct	180
ggaacacggc	atccagcccg	atggccagat	gccaagtgc	aagaccattg	ggggaggaga	240
tgactccttc	aacaccttct	tcagtgcagc	gggcgctggc	aagcacgtgc	cccgggctgt	300
gttttagtag	ttggaaccca	cagtcattga	tgaagtgcgc	actggcacct	accgccagct	360
cttcaccctg	agcagctcat	cacaggcaag	gaagatgctg	ccaataacta	tgcccgangg	420
cactacacca	ttggcaagga	gatcattgac	cttgngttgg	acccaattcc	aaacctggct	480
gaccatgcac	cgggctttan	ggnttnttgg	gttttcccaa	antttggggg	ggaactgggt	540
ttgggttaac	ttcctgntna	tggnacgntt	ttaaatgaat	ntgggaaaaa	tccaactggn	600
gntttcc						607

<210> 236
 <211> 608
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1) ... (608)

<223> n = A,T,C or G

```

<400> 236
acgcgggcat gcaacaccac acccagcctg aaaccagat ttttaatatg aaatcaaagt      60
cttcagacct tgtagggtgtc ataaaaagca cgctgaggac cactagtttg caactgccaa    120
tctaaaatat catagacatt atatcacttc aaccacgaaa aaaaagtatg tgaggcagaa    180
aatggaagca accatgccta atttattgtt gaatactttt tccgtatacc aagagcttcc    240
tttgactag catctgaaac tatatccaga atgacactgg ttttcataaa agtggtgatc    300
ctcacacctc tttatagtct tgcacctagc acagtggagt gaaacacttt aaatagcact    360
tgntccttga gtatatatgg aaaaaagtga agtattgata aagtgtctca ctaatatgag    420
cagcatctca ggagtctcca attcttgaat taccaggag tatttttacc attttcccca    480
ntgnaaggcc ttttttgaga nacttaccct caaatngaan gnnttaagca tgntcctttt    540
tttttccttt tttttttgan aaaagggtct gctntgtggc caggttggan tgcctacntg    600
aaaattcn                                     608

```

<210> 237

<211> 609

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(609)

<223> n = A,T,C or G

```

<400> 237
actatttcat atattgtgtg agccccacaa atgtctattt taaaaagagt atagtccctg      60
gccaggcgcg gtggctcagc cctgtaatcc cagcagtttg ggaggccgag gtgggaggat    120
cacctgaggt ctggagtctg agaccagcct gaccaatatg gtgaaacccc gtttctacta    180
aaaatacaaa attagctggg catggtggag catgcctgta atcccagcta ctccggaggc    240
tgaggcagga gaatcacttg aaccggggag gcgaaggctg cagtgaacca agatcacgcc    300
attgcactcc agcctgagca acaagaggga cactccgtcc ccaaaaaaaaa aataataaaa    360
aaaataaaaa ataaaaataa aaagagtata gttcccaatg ggttctacaa acattcctga    420
tttatactgg ggggaagtgat gcctaantgg gaacattaat cattatggtt tcgaaaatta    480
aatattttctg caaacaattc ctttgcaaat gctaacttgc catgagctta ccccatgtga    540
aattgngnct ttacaaagac cttggccgga ccccttangg ngaattcagn cactggnggg    600
cgttctttg                                     609

```

<210> 238

<211> 616

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(616)

<223> n = A,T,C or G

```

<400> 238
acgaggcggt gcggaagtc ctgcacggga accagcgcaa gcgccgcaag ttcttgagga      60
cggtggagtt gcagatcagc ttgaagaact atgatcccca gaaggacaag cgcttctcgg    120
gcaccgtcag gcttaagtcc actccccgcc ctaagttctc tgtgtgtgtc ctgggggacc    180
agcagcactg tgacgaggct aaggccgtgg atatcccca catggacatc gaggcgctga    240

```

aaaaactcaa	caagaataaa	aaactgggtca	agaagctggc	caagaagtat	gatgcgtttt	300
tggcctcaga	gtctctgatc	aagcagattc	cacgaatcct	cggcccaggt	ttaaataaagg	360
caggaaaagt	tcccttcctg	ctcacacaca	acgaaaacat	ggtggccaaa	agtggatgag	420
gtgaagtcca	caatcaagtt	ccaatgaaga	aggggtatgt	ctggcttgta	acttgttggt	480
cacgtgaaga	tgacngacga	tgacttgngt	ataacattna	nctgggctgg	caacttcttg	540
gggcaatgnt	caanaaaact	ggcaaaatgt	ccgggccttt	tttttagagc	cccttggnaa	600
accccgangcc	ntttta					616

<210> 239
 <211> 607
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(607)
 <223> n = A,T,C or G

<400> 239						
acagtctggt	cgagaacacc	ttgggtcatga	aagtgacaac	ctgctgtttg	ttcagatcac	60
aggcaaaaaa	ccaaactttg	aagtgggttc	ttctaggcag	cttaagcttt	ccatcaccaa	120
gaagtcttct	ccttcagtga	aacctgctgt	ggaccctgct	gctgccaaagc	tgtggaccct	180
ctcagccaac	gatatggagg	acgacagcat	ggatctcatt	gactcagatg	agctgctgga	240
tccagaagat	ttgaagaagc	cagatccagc	ttccctgcgg	gctgcttctt	gtggggaaaag	300
ggaaaaagag	gaaggcctgt	aagaactgca	cctgtggcct	tgccgaagaa	ctggaaaaag	360
agaagtcaag	ggaacagatg	aacttccaac	ccaagtcaac	ttgtggaaac	tgctcctggg	420
cgatgccttt	cgttgtgcca	ctggccctac	cttgggatgc	cagcntnaaa	ctggggaaaa	480
gngcttctaa	tgatancatc	tttattgaag	cctaagaagg	ttctgaattg	ggaccatttt	540
gttcttcaac	caattctggn	cttaaatcca	ccttgggggt	cttccacctc	cttggatttg	600
ncacctt						607

<210> 240
 <211> 615
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(615)
 <223> n = A,T,C or G

<400> 240						
ggtacgcggg	gctttttcaca	agatggcgcc	gaaagcgaag	aaggaagctc	ctgcccctcc	60
taaagctgaa	gccaaagcga	aggcttttaa	ggccaagaag	gcagtgttga	aaggtgtcca	120
cagccacaaa	aagaagaaga	tccgcacgtc	acccaccttc	cggcggccga	agacactgcg	180
actccggaga	cagcccaaatt	atcctcgga	gagcgctccc	aggagaaaaca	agcttgacca	240
ctatgctatc	atcaagtttc	cgctgaccac	tgagtctgcc	atgaagaaga	tagaagacaa	300
caacacactt	gtgttcattg	tggatgttaa	agccaacaag	caccagatta	aacaggctgt	360
gaagaactgt	atgacattga	tgtggccaag	gtcaacaccc	tgattcggcc	tgatggagag	420
aagaaggcat	atgttcgact	ggctcctgat	tacnatgctt	tggatgttgc	cacccaaatt	480
gggatcattt	aactgagtc	acttgctaaa	tctgaatata	tatatatata	tatatctttt	540
cnccccaaaa	aaaaaaaaaa	aaaaaagtnc	tncccgcgcg	ccgtttaaag	gggaattccc	600
cacttggggg	cgttt					615

<210> 241
 <211> 365
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(365)
 <223> n = A,T,C or G

<400> 241
 acgggggggt cgctttgctg ttcgtgatat gagacagaca gttgcggtgg gtgtcatcaa 60
 agcagtggac aagaaggctg ctggagctgg caaggtcacc aagtctgccc agaaagctca 120
 gaaggctaaa tgaatattat ccctaatacc tgccacccca ctcttaatca gtggtggaag 180
 aacgggtctca gaactgtttg tttcaattgg ccatttaagt ttagtagtaa aagactgggt 240
 aatgataaca atgcatcgta aaaccttcag aaggaaagga gaatgttttg tggaccactt 300
 tgggttttctt ttttgcggtg ggcaagtttt aaagttatta agttttttaa atcaagtacc 360
 tnggn 365

<210> 242
 <211> 625
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(625)
 <223> n = A,T,C or G

<400> 242
 natngganng nttttccctt aacgtgggcc ncggccgagg nacttttttt tttttttttt 60
 tttttttttt gcaggcagct atttaattan gntcttaana catttanaac nccaatttgn 120
 gaanataaat tccattcgct anaacaaacn cagatcgcan gtagccctgg anctgangaa 180
 taactttgat ttttggnaaa atttgngagt ccncagcttt ctgatcaatc ttgcgctgct 240
 cccnaatctc atatttctct ttttctgggg ccaaaatctt accttctctg ngctctgggt 300
 ttcgcaactt cttcttcttg aaagaagcct cagtaaaaaat ggtttgggaa ttttacatta 360
 ctgatatcca atttnggtga aatggcaatg accaatttct nggggggtct tcgtaaaaga 420
 actccantga nggnccaaag gtccagtcct aagtataggg nctnaccact gnttcaggaa 480
 accacctttt gncctggggg gtccatgagg atgaccaa atggccccggg naagctgggt 540
 ccantttttt acggcctacc gaagggtttt tgccngggta aaagttttag ggccattttc 600
 ngggnaaatc taggcttttg gaaat 625

<210> 243
 <211> 639
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(639)
 <223> n = A,T,C or G

```

<400> 243
nncnaattcc nccntaacn ggnccccgcnc caagnacccc ggnccecttg gatgtatnga      60
aatnaacnta ttaatgggga cntattggag aaggaaatnc ctagacctac aactttnagc      120
naatagcngt gatgttttag gaactgaaat gtcacactta aagtcttnag ccagctact      180
tccctatttt tgtggggaga aaanggccng attagaactg ttctggttgt gtttggcggg      240
aggggaataa tttttgttca gtccttctta gtgaccaaac ttttaatttt aagaataata      300
tattgactta ctgaactgaa gcattctgag ttgaaaggag ctccncagga ntggagttct      360
gtgttgctca catgttnaaa ncttgctcac cttnatagcn caaggaatac ctatcttcca      420
natnccgcca ttttcatctc ttaaagtagn tccaaagtat gacttgagaa agttgctctn      480
ggattctggg gtcttaaaac tngggattct gggattntgg ggtecnaaag ttnacctgn      540
aaagttgcct gggnttttan aaatncnctg nattctgggg ttttaaaaaa ttttgaaaaa      600
acccncccn ncttgaaaag gaccttaaaa attaacctn      639

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```

<210> 244
<211> 614
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc_feature
<222> (1)...(614)
<223> n = A,T,C or G

```

```

<400> 244
tcgagccgnc ggcccgggccc aggtactttt tttttttttt tttttttttt gaaaatggag      60
tcttgctctg ntgccaaact ggantgcaat ggtgcganct gggctcactg naatctccac      120
ctnccgggtt caagcgattc tctgcctca cctccgagta actgggacta cagggtgcgcg      180
ccaccaagcc cagctcattt ttgnattttt agtanaaatg gggtttcacg atgttggtta      240
ngatggntct gatctctggt caaagctctt tctgnaaata tccttggtta aaaaacaatt      300
ttagactgta gctgttgcaa atgctttaag gaagaaacna aacaactgca gtcttcctga      360
aatgaaaaaa ctcccaggg ctgctattna aaacaacccc accagcactt caatcatgat      420
gccnacagtg gccactgaa aaancnggaa aagttcnaat cccaaactgg gatgctcttg      480
actntggaat tntgngggcn ntncceant ttnanacaaa acngnctngg nccctntttt      540
ttgggggaat ttgggaanaa aaaaacttgn gngttcttgn ggttccttg ttccccaaaa      600
nactgggggn nggg      614

```

```

<210> 245
<211> 620
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc_feature
<222> (1)...(620)
<223> n = A,T,C or G

```

```

<400> 245
gccgtggtcg cgggccgagg tccatttgcc tcccggcctc aagecgattc tctgcctca      60
gccctccaag tagctgggga ttacaggcac ctgccaccat gcccggttaa tttttgnaat      120
tttagtagag acagggtttc accatgttgc ccaggctggt ttcgaaactc tgacctcagg      180
tgatccaccc gcctcgccct ccaaagtgtt gggattacag gcttgagccc ccgcgccag      240
ccatcaaaat gctttttatt tctgcataat ttgaataact tttacaattt aaaaaaatga      300
tctgntttga aggcaaaatt gcaaactctg aaattaagaa ggcaaaaatg taaaggagtc      360

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aaaactataa	atcaagtatt	tgggaaagtg	aagactggaa	gctaatttgc	attaaattca	420
caaactttta	tactctttct	ggatatacat	tttttttctt	taaaaaacia	ctttngatca	480
gaatagcccc	atctagaacc	ttttgggtatc	agncaatatt	tttaaatagt	tnaaccnggc	540
ctaagctnaa	agnggcttga	tntgagtaaa	cttttcaact	ggcttgaacc	ctnaaccttt	600
taaaatgacc	ttccgagntt					620

<210> 246
 <211> 595
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(595)
 <223> n = A,T,C or G

<400> 246						
acttattctt	caggggttac	tgagtcggca	cctatgacag	ctaagagagc	tttcttaaag	60
actgcctcag	tgtcttcttg	gcttttggca	ccttcactcc	actctgcccc	ggaaatccac	120
aatggcagac	aaacctgggg	tttcaggtgc	acaaagactt	cttcaaaaag	catggctatg	180
tcagggctct	ttgactcgat	cagcacctgc	agcttcagct	gccacattgt	cccagagtct	240
ctaaacaatt	caagttccag	ctactgncac	ttccagagct	tcctcaggaa	gttataaacac	300
agcaacgaaa	cactcaactg	cttgtattgg	cattctgaca	gaagcttcaa	gttcattgtgc	360
cttcctgaat	acagtcattg	tcttttcaac	ctcttcctct	aaggaccac	tatttgactt	420
cttaataaat	ctttccagcc	aaaggngatg	aacactttca	catgggcctt	gtggcaaaaag	480
cttnatggct	ttttatcncg	gacagacctt	tctcttcggg	cgacctcaat	ggtttggctt	540
ggtcgtggag	ctggtnnttg	gctnggactc	aacttnaatn	ttgcttgccc	naaac	595

<210> 247
 <211> 364
 <212> DNA
 <213> Homo sapiens

<400> 247						
gggtacacta	gaaagtcttt	tacaaaataa	tcactcttaga	tcaacagaag	accaatcttc	60
aatgtcgtcc	tgcaagatgg	gttactttta	catctcctcc	tgttttctcc	aatgttctcc	120
tttagtatgg	ctggtaattg	ttttgggtgat	tgccaccccc	tcgagatgcc	ttgccataag	180
tgctctgttg	gccactgtag	tctgcatatc	cctgtccata	tccatagtcc	ccatagtatt	240
accaggtata	atcatatccg	ccatagccac	tatagttttg	atcaccacca	taggcactat	300
tgtaatttcc	atatacttga	tcataatagt	tattaaatcc	ttggttccag	ttttggccct	360
gacc						364

<210> 248
 <211> 591
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(591)
 <223> n = A,T,C or G

<400> 248

ggtncagata	tcttcaaagg	aggaagaaga	aagggaaacc	agatgggtgga	cctgaatatg	60
ncccttancc	aganctaatac	aacccactca	gccagaatag	aagaagctgg	aatagattcc	120
ccaacctggg	ttgccagttc	atcttttgac	tctattaaaa	tcttcaatag	ttggattct	180
gnaatttcac	tctcatgant	gnactgngg	cttaactaat	attgcaatgn	ggcttgaatg	240
taagtagcat	cctttgatgc	ttctttgaaa	cttgnatgaa	tttgggtatg	aacagattgc	300
ctgctttccc	ttaaataaca	cttaaaatta	tttggaccag	tcagcacaa	atgcctnggt	360
tgnattaaag	cnnggatatg	ctggatttta	taaaattggc	caaattagag	aaatntagtc	420
ccatggaaat	atatttcttg	taaaaaagtg	cttgaatctt	tttgggtcaag	ataatgccac	480
tcttaagaat	atcttcncac	tnttgangga	ttaaataatcg	gcantggaaa	agccttaaaa	540
atggggctcna	cttgccctgn	gcctaaaccg	accctgaaat	gggatttccc	n	591

<210> 249
 <211> 332
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(332)
 <223> n = A,T,C or G

<400> 249						
actctccgag	agggtcgttt	tcccgtcccc	gagagcaagt	ttattttacca	aatgttggag	60
taataaagaa	aggcagaaca	aaatgagctg	ggcttttgaa	gaatggaaa	aaagggctgc	120
ctcaagagct	cttcagaaaa	ttcaagaact	tgaaaggaca	gcttgacaaa	ctgaagaagg	180
aaaagcagca	aaggcagttt	cagctttgac	agtctcgagg	cttgcgcttg	cagaaacnaa	240
aacagaaagg	ttgaaaatga	aaaaaccag	ggtaccttgg	nccgggacca	cgcttaaggc	300
gaaattccaa	cacacttggc	cggcgggtac	ta			332

<210> 250
 <211> 626
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(626)
 <223> n = A,T,C or G

<400> 250						
ggtactatta	gccatgggtca	acccaccgt	gttcttcgac	attgccgtcg	accggcgaag	60
ccctttggcc	cgcgctcttc	tttgaactgg	ttgcagacaa	gggtcccaaa	ganagcagaa	120
aattttcggtg	ctctgagcac	tgagagaaaa	ggatttggtt	ataaggggtc	ctgctttcac	180
agaattattc	caggggttat	gtgtcaagg	ggtgacttca	cacgccataa	tggcactgg	240
ggcaaaagtc	atctatgggg	aagaaatttg	aagatgaaga	acttcaccc	aaagcatacg	300
ggtcctggca	tcttgtccat	ggcaaatgct	ggaccaaca	caaattgggtc	ccaatttttc	360
atctgactg	gccaagactg	antggttgga	tggcaaanca	tgtngtgntt	ggccaaagt	420
aaagaaggca	tgaatattgt	ggaaggccat	ggaacgcttt	tgggtncnag	gaatggcaag	480
aaccnccagg	aagaatcacc	cnttnttgac	tggggacaac	tcnaataagt	tgacttgggg	540
nttaantntaa	ccccccanca	attccttttg	gaactcagga	aacacccttc	ancccanttn	600
tttcaanttc	caaaannttg	ggcctn				626

<210> 251

<211> 603
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(603)
 <223> n = A,T,C or G

<400> 251
 actttttttt tttttttttt tttttttttt aacagaagaa cttttngttt cttttattttc 60
 aatatngtc ttattaatat ttttcttatt ttataatgca attacaacaa tttaggagac 120
 aaaacantat aaacaaaaga atgttaaata gtttttttta aaaaatagct tggtgcttgc 180
 aagaaagtcc atataatctt attccccccc aaatataatt ttatactttg cactaaacca 240
 aaatagctta tggaaaatta ggtattaaat agctaaacac agaaaacctt cagctataaa 300
 taacataaaa tacagttaa ctttaatgng atgcttaaac aaagcaact atgatgcant 360
 atgaatcaac ttcattaatt ggacaagtcc agtgaggcnc aaattagata agcnctaaac 420
 cctcatgatg ggcaagtga accttcaccc cagcaagggt ctttcnggtc ttggctatgc 480
 caattccttc canaaaagnc ccagttttac angtctggct ttttcggggg gaacccccca 540
 tttnttttnc ccaagttggt tnggatttgg ccccannaa attttttttg gngnaaaaan 600
 aan 603

<210> 252
 <211> 500
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(500)
 <223> n = A,T,C or G

<400> 252
 actttatttg ttttttttgt tttgttttgg tttttttttt ggcttgactc aggattttaa 60
 aactggaacg gtgaagggtga cagcagtcgg ttggagcgag catcccccaa agttcacaa 120
 gtggccgagg actttgattg cacattgttg tttttttaat agtcattcca aatatgagat 180
 gcattgttac aggaagtccc ttgccatcct aaaagccacc ccacttctct ctaaggagaa 240
 tggcccagtc ctctcccaag tccacacagg ggaggtgata gcattgcttt cgtgtaaatt 300
 atgtaatgca aaattttttt aatcttcgcc ttaatacttt tttattttgt tttattttga 360
 atgatgagcc ttcgtgcccc cccttcccc tttttgttcc cccaacttga gatgtatgaa 420
 ngcttttggg ctccctggga agtgggtgga ngcagccagg gcttacctgt accttggccg 480
 cgaacaccta aggccaantt 500

<210> 253
 <211> 634
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(634)
 <223> n = A,T,C or G

```

<400> 253
tcgagcggcc ngcccgggca ggtactatta gccatgggtca aacccccaccc gtgtttcttcg      60
acattgcccg tcgacggcga acccttgggc ccgcgtctcc tttgagctgt ttgcagacaa      120
ggtcccaaag acagcagaaa attttcgtgc tctgagcact ggagagaaaag gatttgggta      180
taagggttcc tgctttcaca gaattattcc aggggttatg tgtcaggggt ggtgacttca      240
cacgccataa tggcactggg ggcaagtcca tctatgggga gaaatttgaa gatgagaact      300
tcacccataa gcatacgggt cctggcatct tgtccatggc aaatgctgga cccaacacaa      360
atggttccca gtttttcatc tgcactgcc aagactgantg gttggatggc aaacatgtgg      420
tgtttggcaa antgaaagaa ngcatgaata ttgtggaagc catgganccc tttnggtcca      480
ggaatggcag aacnnccagg aanacacct tgntgactgt ggcaactcga ataaattgac      540
ttggggttat cttaaccncc caacattcct ttggacttag gaancanccc ttcancnccnt      600
tggttcaant tccccaaaat ttgggctncc tnnng      634

```

```

<210> 254
<211> 602
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc_feature
<222> (1)...(602)
<223> n = A,T,C or G

```

```

<400> 254
nctttttttt tttttttttt ttttttaaat taattaatta aaaaataggt ggnctactgg      60
tggtccttaa gctggaantg cagtgggcac aatcatggnt cactgnagtc tnaacctncc      120
agggtcaagt gatectccta cctcacctcc antagctggg attacaggca tatgcgacca      180
tgcccagcta attttttatt ttttgtaaaa acgggggtctc actatgtcgc ccangctggg      240
cttgaactcc tgaactcaag tgacccttcc gnctnacctn caaagtgcta ggcttacagg      300
tgtgaaccac catgcctggc ctaaaaaatt tatttttaaaa aagtaattta tctcttacag      360
ttgtggaggc tgagaaatcc aangncaant ggencatttg gtgaaaacct tnttgcctgg      420
ggggactctg tgaaatnccc aantggcnca tgcatnacac antgangggg cttacattcc      480
aacatgctat ctcttttaag ttttaagta cnggcnaaa tntgaacntg aatgacttna      540
aatccacnca ttcnctttt ggacnaaaaa cntggggcaa ttgggatctt ggcntttttna      600
aa      602

```

```

<210> 255
<211> 614
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc_feature
<222> (1)...(614)
<223> n = A,T,C or G

```

```

<400> 255
cgaggtacag gtaagccctg gctgcctcca cccactccca gggagaccaa aagccttcac      60
acatctcaag ttggggggaca aaaaaggggg aagggggggc acgaaggctc atcattcaaa      120
ataaaacaaa ataaaaaagt attaaaggca agattaaaaa aattttgcat tacataattt      180
acacgaaagc aatgctatca cctcccctgt gtggacttgg gagaggactg gaccattctc      240
cttagagaga agtgggggtg ctttttaggat ggcaagggac ttccctgtaac aatgcatctc      300
atatttggaa tgactattaa aaaaacaaca atgtgcaatc aaagtccctg gccacattgt      360

```



```

gaacttttggg ggatgctcgc tccaaccgga ctgctgtcac cttcacccgt ccagttttta 420
aatcctgagt caagccaaaa aaaaaaaacc anaccaaacn nanaaaccaa ttaagccatg 480
ccaatctcat ctggttttctg cncaagtang gttgncaaaa aagggttacc ncactaantc 540
ntagccccta aaccnttgcg ggggncantg angggccgan tttganactc cggntggtga 600
nccanttggn ggag 614

```

```

<210> 256
<211> 308
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc_feature
<222> (1)...(308)
<223> n = A,T,C or G

```

```

<400> 256
nntccagca gtgggtcatt cgncaacgaa agtcntaccg tagaaaagat ggcgtgtttc 60
tttatatttga agataatgca ggagtcatag tgaacaataa aggcgagatg aaaggggtctg 120
ccattacagg accagtagca agggaatgtg cagacttgtg gccccggatt gcatccaatg 180
ctggcagcat tgcattgatt tccagtatat ttgtaaaaaa taataaaaaa ctaaacccaa 240
aaaaaaaaat nnnannnaac annnnanaaa aannnnnaaaa aaaaaaaagta cctnggccgn 300
gaccacgc 308

```

```

<210> 257
<211> 602
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc_feature
<222> (1)...(602)
<223> n = A,T,C or G

```

```

<400> 257
gcgtgggtcgc nggccgaggt acgcggggga gacaaacat accatatccc accagagagt 60
cgcagacact atgtgcctc catggccctg cccagtgtat cttggatgct gctttcctgc 120
ctcatgtctg tgtctcaggt tcaagggtgaa gaaccccaga gggaaactgcc ctctgcacgg 180
atccgctgtc ccaaaggctc caaggcctat ggctcccat gctatgcctt gtttttgtca 240
ccaaaatcct ggacagatgc agatctggcc tgccagaagc ggccctctgg aaacctggtg 300
tctgtgctca ntggggctga gggatccttc gtgtcctccc tggatgaagag cattggtaac 360
agctactcat acgtctggat tgggctccat gacccacac agggcaccga acccaatgga 420
aaangntggg antggaataa cantgatgtg atgaattact ttgcatggga gagaaatcct 480
tcancatttt naaccccggc cctgtccaac ctntcaaaaa cncacatfff taaggggaaa 540
atcttactgg atggganggt acccttttnt ggaagtactg cttttcngga nggaagtacc 600
cc 602

```

```

<210> 258
<211> 600
<212> DNA
<213> Homo sapiens

```

```

<220>

```

<221> misc_feature
 <222> (1)...(600)
 <223> n = A,T,C or G

<400> 258
 ggtgtntgng ncttatntgt agcggcgcgg ntggttctga aatcgccctc agcggcgccg 60
 cagtentatt atgtgnatgt ccctaccacn aaaatncaga ttaattggna tgctcattac 120
 ccacgtgaac gccaaagccc ttcgaagtag tgctgccctg cactnaatca agaagttgca 180
 ttaaaattag aaccaaattc agagtcactg gaactttctt ttaccatgcc ccnattcag 240
 gatcagacac ctatgccttc cgatggaaag cactagacaa agttcacctg agcctaatag 300
 tcccagtgaa tattggtttt atggggatag gtgatatggn caatgaattc aagttggaat 360
 tgggnagaaaa actttttgct naagacncng aagcnaagaa cccattttct actnaaggca 420
 cagatttaga cttggagatg gtagcttcct atatccaatg gatgatgctt tcagtccgtn 480
 cnttgatcag tgnacnntn gaaagcagtt cccaagncct gnaacccagt cctaagccaa 540
 gtccggttcn gcgattaatc cgactatgta tgcccttcat ngcccctgtn ataaacnggn 600

<210> 259
 <211> 600
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(600)
 <223> n = A,T,C or G

<400> 259
 gccgaggtac atgggaaagg gagtatggng agctatttcc tttttaaagg atgaagacct 60
 tcataaattg gccctcgga ttctggtgat tcccgcgcgc aagcgcaa at gctccagtgn 120
 gttatgaaaa tgnttgntaa tctgctctgg ttcttcaactg gattcaagan tcgggaggnc 180
 ttctcgaatc ttttgataa nctggtttaa aacctgaatt gntaccgcga tcattttcct 240
 tttcataaaa atagatatat ctgntcagaa tttctatnaa aagctgcact tgtaganang 300
 ggtccatgca ctgatttgct atttttaaag cttttttan gcactccatt accctnttgc 360
 cttcgtgaaa cttcttccca tttttgncn gggtctggcn gaccngaaga aatgtgcca 420
 agtgcttaca agttnggcct gacaaggctt nttaaaantt tggatgtacc aagggccccc 480
 tgggtcctca aaggctcatga atctttttac tggaaccctt atcctttnaa aaggccatgg 540
 tcaagggaaat gnncttcttg gctttgaaac ccggattaan tttttncaa aaaagccngn 600

<210> 260
 <211> 593
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(593)
 <223> n = A,T,C or G

<400> 260
 acgcgggaac tccatctca ccacccacac caccctggag cactctgatt gtgccttcat 60
 ggtagacaat gaggccatct atgacatctg tcgtagaaac ctcgatatcg agcgcaccaac 120
 ctacactaac cttaaccgcc ttattagcca gattgtgtcc tccatcactg cttccctgag 180
 atttgatgga gccctgaatg ttgacctgac agaattccag accaacctgg tgccctacc 240

```

ccgcateccac ttectctggc cacatatgcc cctgtcatct ctgctgagaa agcctaccat      300
gaacagctta ctgtagcaga gatcaccaat gcttgctttg agccagccaa ccagatgggtg      360
aaatgtgacc ctgcgccatgg taaatacatg gcttgctgcc tggatataccg tggtgacntg      420
ggtnccaaag atgtcaatgc tgccttggca ccattcaaac caagcgcaga ttcaatttgg      480
ggatggtgcc cactggcttt aaggtngnat naactaccag cttccactgn ggnnctgggtg      540
gaaactngcc aaggnnccct ggccggaaca ccctangggg aattcanncc act              593

```

```

<210> 261
<211> 343
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc_feature
<222> (1)...(343)
<223> n = A,T,C or G

```

```

<400> 261
cctacctctc ttncactgc aaatttctgg gatagaccaa aagtgaattt gattatgtgt      60
tggtgaagt tcttcattct gactgttgan gggaggtttt ctttgaaga gttttcatcc      120
cagactcagc tgtcttttca catggatgaa ataattcctg ctaccaacaa cagagcttca      180
ccaggaagt ggagttttcaa gatgccttgt tgctttgaag aagggagtga tgtcaattct      240
cttgntacat tctcccttta gcaacctgag taagagactc tctgccactg ggctgcaaaa      300
aaataaatta cttgaatctc cccttgggcc angctgaggt acc              343

```

```

<210> 262
<211> 593
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc_feature
<222> (1)...(593)
<223> n = A,T,C or G

```

```

<400> 262
actttttttt tttttttttt tttttttgtt tttttttttt tttttttttt tttttttttt      60
ttttttttt ttacagngtn ttttcatttt tattactcaa aaaagtttca tttttttnat      120
ttanctttnt gactntgggc ttgggccttn aacantttca naacgatttt ntgctcctcg      180
anaaggaaag cnccttgat cctgncacna acncttttag cncacatgga accnccatag      240
gccctgntga catgtttctt tgtttnggac aatntcataa aaacttttagg nnttacagca      300
cnaacccctn naagtntgcc tgggncaca ccanatgcaa attttggggc tttcccaacc      360
ttnttggnat aaaggtaaac aattttatta ccagggggtt cgggacaacc tanttttgtt      420
aaaggctgta ttgtaggaaa acctacctcg ggatgtcaaa cccttnacca ttttgagggn      480
ctggaaaanaa ngttcccgga aancctcggt tancttnggc cggaaccccc taangggnga      540
attccnaccn cttgggggcn gtantaaggg ganccaantt gggccaaant tgg              593

```

```

<210> 263
<211> 591
<212> DNA
<213> Homo sapiens

```

```

<220>

```

<221> misc_feature
 <222> (1)...(591)
 <223> n = A,T,C or G

```

<400> 263
accaagagtt tgctcctggc tgctttgatg tcagtgtctgc tactccacct ctgcggcgaa      60
tcagaagtaa gcaactttga ctgccgtctt ggatacacag accgtattct tcatcctaaa      120
tttattgtgg gcttcacacg gcagctggcc aatgaaggct gtgacatcaa tgctatcatc      180
tttcacaaaag aaaaagttgt ctgtgtgcgc aaatccaaaa cagacttggg tgaaatatat      240
tgtgcgtctc ctcaagtaaaa aagtcaagaa catgtaaaaa ctgtggcttt tctggaatgg      300
aattggacat agcccaagaa cagaaagaac cttgctgggg ttggagggtt cacttgcaac      360
tcatggaggg ttaaatgctt atctaatttg tgcctcactg gacttgncaa ttaatgaagt      420
gatcatattg catcataagt ttgctttggt taancttaca ttaaagttaa ctggatttta      480
agggaattat actgtagggt ctggggtaac tatttaatac taattttcat aacnattttg      540
gttaatncca agttnaaatt tatttggggg gaanaaaatt tttggccttc t          591

```

<210> 264
 <211> 595
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(595)
 <223> n = A,T,C or G

```

<400> 264
accaagagtt tgctcctggc tgctttgatg tcagtgtctgc tactccacct ctgcggcgaa      60
tcagaagtaa gcaactttga ctgccgtctt ggatacacag accgtattct tcatcctaaa      120
tttattgtgg gcttcacacg gcagctggcc aatgaaggct gtgacatcaa tgctatcatc      180
tttcacaaaag aaaaagttgt ctgtgtgcgc aaatccaaaa cagacttggg tgaaatatat      240
tgtgcgtctc ctcaagtaaaa aagtcaagaa catgtaaaaa ctgtggcttt tctggaatgg      300
aattggacat agcccaagaa cagaaagaac cttgctgggg ttggagggtt cacttgcaac      360
tcatggaggg gtttagtgct tatctaattt gtgcctcact ggacttgctc aattaatgaa      420
gttgattcat attgcatcat agtttgcttt ggtaagcat cacattaaag ttaaactgga      480
ttttatggta tttatagctg nanggtttct ggggttanct atttaatact aaatttccat      540
aagctttttg ggtaangcc aagnttaaaa tttttttggg ggggaaaaaa atttt          595

```

<210> 265
 <211> 592
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(592)
 <223> n = A,T,C or G

```

<400> 265
ggtagcttttt tttttttttt tttttttttt ttgaaaatta tactttttatt tgagtcacca      60
ggagaaaagat tcaattgtgg ttcaagtcaa atgttcanaa tcataacagg ccanaaagggt      120
ttgatccccga gcacaagccc acgagggagg ggacaaaaac agacaaaaat gagacaacaa      180
ccccatataa aaagatgaac tggcggcttc acacactcac acacatacac atacacacgg      240

```

atgaaatgtt	tggacagagg	caaatttcac	gtggtcattt	ctgtttcttt	ttaaatacag	300
gtttgtgggg	tggatatttg	ttttttccag	ctataaaaaa	aggcccaaaa	gtgcatgtgt	360
gaggggggaa	aggcagaaat	taagcaataa	agtcattttc	cctggaggga	catganaggg	420
agaaaacagg	aggcaattgc	tggganaacg	cactttctta	acactgggct	tttgggtatt	480
cttantattg	gnccncaaaa	agttattttc	acattctaac	tttgaagnct	ntttccnggg	540
attnaatggn	ccttaaaacc	tttggaact	ttaaaaaac	cngggcttac	cc	592

<210> 266

<211> 594

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(594)

<223> n = A,T,C or G

<400> 266

acgcggggaa	aaaaaaggca	gtattccctt	tttaaagtag	ctttcaggaa	gttgctgaga	60
aatgggggtg	aataggggaa	tgtaatggcc	actgaagcac	gtgagagacc	ctcgcaaaat	120
gatgtgaaag	gaccagtttc	ttgaagtcca	gtgtttccac	ggctggatac	ctgtgtgtct	180
ccataaaaag	cctgtcacca	aggacgttaa	aggcatttta	ttccagcgct	ttctagagag	240
cttagtgtat	acagatgagg	gtgtcccgt	gctgctttcc	ttcggaatcc	agtgtttcca	300
cagagattag	cctgtagctt	atatttgaca	ttcttcaactg	tctgttggtt	acctaccgta	360
gctttttacc	gttcacttcc	ccttccaact	atgtcccaga	tgtgcaggct	cctcctctct	420
ggactttctn	caaaggcact	tgacccttcg	gnctctactt	ggcccctnac	ctcacccctt	480
tctggcaccg	gncttngac	attcacttcn	gagaagaccn	cccccaagga	ggcnggcgnt	540
tggncanga	aaaaaccccg	gggaagggtt	tntttttttn	aaagggaat	ttcc	594

<210> 267

<211> 598

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(598)

<223> n = A,T,C or G

<400> 267

actggccctc	ggtgctggca	aagggtgtagt	tccactggcc	gaggggaatca	agacatagt	60
gtcctttctg	taagccaagg	gctgccacaa	tgacacagta	gccagatcct	gcaattccaa	120
tgagagcagc	caatacagaa	gaaagcatcg	cacatcgttt	gccacagttt	tcatggccac	180
agcagccaca	gcagtcaccc	tgttccagcc	caatgaagac	aaatgctggc	aggagcatca	240
gcagggccac	ctcctacgat	gccagaaaaa	aaccacacga	aacggctgag	gtggttttcg	300
gaggcatact	ttgttcccat	tgggaaagta	aagccaaata	ttaccccgca	tgcacaggaa	360
ggggcgagcc	caaccagaaa	atgtccgaat	gcatcgtgca	cacttcccat	agcacatggt	420
ggtcttgcta	ggttttttct	ccccttctct	ttggnccttca	acttcagtga	taccccaaat	480
tagatgaaag	tggtgccctt	ttgggtggaa	aaagcaaaca	ccaaccccg	gtacctttgg	540
gccggaacac	ncttaaggcc	aattccannc	aattggcggc	ccgtacttan	gggatccc	598

<210> 268

<211> 590

<212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(590)
 <223> n = A,T,C or G

<400> 268
 ggacatatta tcaataggct ataagatgta acaacgaaat gatgacatct ggagaagaaa 60
 catcttttcc ttataaaaaat gtgttttcaa gctgttggtt taagaagcaa aagatagttc 120
 tgcaaatcca aagatacagt atcccttcaa aacaaatagg agttcagggg agagaaacat 180
 ccttcaaagg acagtgttgt tttgaccggg agatctagag agtgctcaga attagggcct 240
 ggcatttgga atcacaggat ttatcatcac agaaacaact gttttaagat tagttccatc 300
 actctcatcc tgtattttta taagaaacac aagagtgcac accagaattg aatataccat 360
 atgggattgg agaaagacaa atgtggaaga aatcatagag ctggagacta cttttgtgct 420
 ttacaaaact gtgaaggatt gtggtcacct ggaacaggct tncaatctat gtagcactat 480
 gtggctcanc cttggtaccc cttggattat atatcaacct gnaacatgng nctgggactt 540
 actttcnaaa cnaaatnttc cttntttgaa gaaaatctgg gtttttgnaa 590

<210> 269
 <211> 602
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(602)
 <223> n = A,T,C or G

<400> 269
 acttgaagga agtcgaatca gagatagact ctgaagaaga acttataaat aaaaaaagaa 60
 tcatagagaa agttattcat cgactcacac actatgatca tggttctaatt gagctcaccc 120
 aggctggatt gaaaggctcc acagagggaa gtgagagcta tgaagaagat ccctacttgg 180
 tagttaaccc taactacttg ctcgaagatt gagatagtaa aagtaactga ccagagctga 240
 ggaactgtgg cacagcacct cgtggcctgg agcctggctg gagctctgct agggacagaa 300
 gtgtttctgg aagtgatgct tcaggatttg ttttcagaaa caagaattga gttgatgggc 360
 ctatgtgtca cattcatcac aggtttcata ccaacacagg cttcagcact tncntttggg 420
 ggtgggttcct ggtcccntgg aagttggaac caaattaatg gngtagtctc tatacccaat 480
 acctttgggt ttcatgtgta anaaaaaggc ccattacttt taanggattg tgcgggncct 540
 attgngccan taactttttt ttaaatggcc cagttacngg ttttaattct taaaannaaa 600
 aa 602

<210> 270
 <211> 595
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(595)
 <223> n = A,T,C or G

```

<400> 270
ggtagcgagg ggtaggagcc tctctcccta ctgctgctac acaagaccct gagactgacc      60
tgcaggacga aaccatgaag agcctgatcc ttcttgccat cctggccgcc ttagcggtag      120
taactttgtg ttatgaatca catgaaagca tggaaatcta tgaacttaat cccttcatta      180
acaggagaaa tgcaaatacc ttcatatccc ctgagcagag atggagagct aaagtccaag      240
agaggatccg agaacgctct aagcctgtcc acgagctcaa tagggaagcc tgtgatgact      300
acagactttg cgaacgctac gccatgggtt atggatacaa tgctgcctat aatcgctact      360
tcaggaagcg ccgaggggacc aaatgagact gaggggaagaa aaaaaatctc tttntttctg      420
gaggctggca cctgattttg tatccccctg tagcagcatt actgaaatac ataggcttat      480
atacaatgct tctttctgga tattctcttg gcttgggtgg accccttttt ccggccccag      540
aattgttaan taatngaann nccntncann aagggnnnaa aggnaaatca nctttt      595

```

```

<210> 271
<211> 592
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc_feature
<222> (1)...(592)
<223> n = A,T,C or G

```

```

<400> 271
ggtagattga gatccgcct ctacaaaatc aaaaaattag ccaggcaagg tgggtgcgtgc      60
ctgtcgcccc agctacttgg caggctgagc tcaggagggtc aagcctgcct tgggccatga      120
tcatcccatg cactccagcc tgacattcag agcaagacct tgtctcaaag aaagaaaaac      180
atTTTTatgg tgttttcttt tttagtcttt tcaataatga aaattttcat tttacaggta      240
aatgaaagg cctggcattt attcaagatc ctgatggcta ctggattgaa attttgaatc      300
ctaacaaaat ggcaacctta atgtagtgt gtgagaattc tcctttgaga tttcagaaga      360
aaggaaacaa tgtgattcaa gatatttaca taccagaagc atctaggact gatggatcac      420
tgtcccgatt caaattatct ttcagtcctt tcccccttc tatttcagct ggtccttttc      480
acctaactgt cagtcattct ggtttcaacn atgctttatc tcatgtcctt gaatatagtt      540
ggggnacttt aatttttang gaataatnna acagnttccn ttaaaggntn ng      592

```

```

<210> 272
<211> 607
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc_feature
<222> (1)...(607)
<223> n = A,T,C or G

```

```

<400> 272
acattaaagt gtgatacttg gttttgaaaa cattcaaaca gtctctgtgg aaatctgaga      60
gaaattggcg gagagctgcc gtggtgcatt cctcctgtag tgcttcaagc taatgcttca      120
tctctcttaa taacttttga tagacagggg ctagtgcac agacctctgg gaagccctgg      180
aaaacgctga tgcttggttg aagatctcaa gcgcagagtc tgcaagttca tccccctttt      240
cctgagggtc gttggctgga ggctgcagaa cattgggtgat gacatggacc acgccatttg      300
tgcccatgat gtcaggctcg gcaacaggct ccttgggtgac actcaccaca ttgnttttca      360
agctgacttt cagcttgncn ccttggagag actttaaccc ggaccaaggg ccgatgcct      420
tccgttacc aggaatttca tcaccaatgg tggantttca ggaatgttgg caagtttctt      480

```

```

tggcatnttc ccaaanagtt tgttcccggt cttnttgggn ggcangggct tcggaaaggg 540
ttnattttgt ngggaaccna aaaactgggg tnaaactcct tnccggttna ngggtttccg 600
nnanccn 607

```

```

<210> 273
<211> 398
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc_feature
<222> (1) ... (398)
<223> n = A,T,C or G

```

```

<400> 273
ggtaccgcca ttattctttt gggcaccttt ggttgttttg ctacctgccg agcttctgca 60
tggatgctaa aactgtatgc aatgtttctg actctcgttt ttttggtcga actggtcgct 120
gccatcgtag gatttgtttt cagacatgag attaagaaca gctttaagaa taattatgag 180
aaggctttga agcagtataa ctctacagga gattatagaa gccatgcagt agacaagatc 240
caaaatagct tgcattgttg tgggtgtcacc gattatagag attggacaga tactaattat 300
tactcagaaa aaggatttcc taagagttgc tgtaaacttg aagattgtac ctgccccggg 360
ccgnccgctc gaaagcttaa ntggccggtt cnaanncg 398

```

```

<210> 274
<211> 587
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc_feature
<222> (1) ... (587)
<223> n = A,T,C or G

```

```

<400> 274
actttttttt tttttttttt tttgttgaat caaaagcagg gtttattttt ctatcaaadc 60
cccaatccat gttccagcca atggatgaag ggtgaatcaa gccccacata gactcttggt 120
aaaaacaatt ctaactttct aaaaaaaaaa aaagccaaca cacttttttc tttcttttca 180
aaaagctccc aggcctttgg gaacagctga aacaaattca tatcctgact aggtctggtt 240
tctcttaggt atttggatgg tccctctctg ctgccacttc tgcacagatg aggcactgat 300
aatggcctgc aggtcactca caatcctagc tccacatcac tccatggttt gataacctag 360
aaccacgtta tgatttccat ttataatgcc ctaagaacag ctgaaaagat ctgtattaaa 420
ttctgcaaat ctttattgag tgccactatt tgctggggcac angctaggcn ctggattctg 480
ctggttcttg agaaacctaa aangnnccct tnggccggaa cacccttang gcgaaatcca 540
cncactgggg ggcgtactaa ngggatccaa ctttgggncca acttggg 587

```

```

<210> 275
<211> 588
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc_feature
<222> (1) ... (588)

```


<223> n = A,T,C or G

<400> 275

actttttttt	ttttttttt	tttgccctta	taagagaatt	tttattgtta	attattttacc	60
ttaatagttt	cagaaagagg	aacaaattag	ctcagtccaa	catgattggc	agttggcata	120
ttctagttaa	gcaagtgttc	tgactgctaa	ggattttaatt	tggataattt	taataacttag	180
ccatctaaca	cttcaagcat	aaccacagaat	aaatgcacca	ccttcctttc	actttaatac	240
ccgnacctac	ctcacttcga	tataagaaat	atcattcaat	atgattttcca	gaagggacaa	300
gtttcctgga	gaatacaggc	atganggaca	atgcacaaaa	agaaaaactc	aaaatnaaac	360
tctggatgga	taattactaa	gctaagggaa	ccaaaccttc	caatttntaa	agaaattaaa	420
tccggttcca	aatgcctnat	angnctatgt	tnaaaagggt	ctggattaat	accggaaaag	480
gnttgnttnt	tacaggatnc	cccaaccgtt	acgggccctt	ngcccagaat	gggccttaaa	540
anccaaagng	tcttttccgn	ngaggcccca	tttnanaatc	cttntttt		588

<210> 276

<211> 595

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(595)

<223> n = A,T,C or G

<400> 276

acttttagata	catcattcct	caaaaagttt	ttaacggaga	aagtggggca	attcaatggg	60
ggaaaggacg	gcctttttta	caaattggtgc	tggtttctact	gggtatctgc	atccttgata	120
cacagaagtt	aactcaagat	ggaccacaga	ctcacatgta	agagctaaaa	taacattcct	180
agaagaaatc	atggaagtaa	atcttcgtga	ccttggatca	ggtaatgggt	actttttttt	240
tttttttttt	ttttttttta	tcagattaat	tttactttat	ttcttcaggc	ctgggggttt	300
tcgatgactt	caaatttggg	atcttcaa	ttgaagggtg	gaaatgggtat	tcattgtctgc	360
attaccaaac	atttgctttg	acttaaaaaag	ctcctctcca	gctcttgccg	atctctgaac	420
tagcatcaac	aggntcctcc	agatgtctgg	nccttaaaatt	tggattccct	aatcttggcc	480
acaaagangt	ttcttgata	gggaacaaag	ttcccttatt	naaatgccan	tngtngaacc	540
nccaatgttc	cttcncaaaa	ngggcttaaa	ccggttacc	aattgacaaa	ggaaa	595

<210> 277

<211> 597

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(597)

<223> n = A,T,C or G

<400> 277

ggtactgttc	ctggtggccg	agtggagact	ggtgtttctca	aaccgggtat	ggtggtcacc	60
tttgtccag	tcaacgttac	aacggaagta	aaatctgtcg	aaatgcacca	tgaagctttg	120
agtgaagctc	ttcctgggga	caatgtgggc	ttcaatgtca	agaatgtgtc	tgtcaaggat	180
gttcgtcgtg	gcaacgttgc	tggtgacagc	aaaaatgacc	caccaatgga	agcagctggc	240
ttcactgctc	agggtgattat	cctgaacat	ccaggccaaa	taagcgccgg	ctatgccctt	300
gtattggatt	gccacacggc	tcacattgca	tgcaagtttg	ctgagctgaa	ggaaaagatt	360

gatcgccggt	ctggtaaaaa	gcttggaaga	tggccctaaa	ttcttgaagt	ctgggtgatgc	420
tgccattggt	tgatatgggt	cctggcaagc	ccatgtgtgt	tgaaagcttc	ttaaactatc	480
cacctttggg	tcgctttgct	ggccngatt	tgagacanac	catttccggn	gggtggcaat	540
caaaccattg	ggccaanaaa	gnttntggac	ttgcaagggn	nccaaatfff	ncccaaa	597

<210> 278
 <211> 595
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1) ... (595)
 <223> n = A,T,C or G

ggtacttttt	tttttttttt	tttttttttt	ttagtttatt	aaaatactga	gttttatttc	60
acatgtatat	ttttgtctcc	ccaccatttc	catgtctgac	caccgctact	actatgtcct	120
atcataacat	tccatacata	cttaaaacca	agcaaagggt	ggagttccat	ctttaaaaac	180
taaacaggca	ttttggacaa	cacattcttg	gcaatagaac	ctggacaaca	tttatcaaac	240
acggtaggga	aagttctcac	tctgcattat	aaaaaggaca	gccagatata	aactgttaca	300
gaaatgaaat	aagacggaaa	atfttttaac	aaattgnnta	aactatfttc	ttaaagagac	360
ttcctccact	gccagagatc	ttgaatagcc	tcttggnccag	tcattccgga	aacaattctt	420
ccataattga	tgaatttggc	tttcaacttt	gggaagagaa	cccccttttc	tatacttggg	480
tgcattttgc	ttaaaggctt	ctacaaacta	gggcctttgg	gggtttaaga	gttttccngg	540
gtcttgaagg	ntcttggcct	ttgaacttgg	ggtnaaaang	gttgngcttt	tccat	595

<210> 279
 <211> 586
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1) ... (586)
 <223> n = A,T,C or G

ggtacgcggg	gagatacgtt	cgtcagcttg	ctcctttctg	cccgtggacg	ccgccgaaga	60
agcatcggtt	aagtctctct	tcaccctgcc	gtcatgtcta	agtcagagtc	tcctaaagag	120
cccgaacagc	tgaggaagcc	cttcattgga	gggttgagct	ttgaaacaac	tgatgagagc	180
ctgaggagcc	atftttgagca	atggggaacg	ctcacggact	gtgtggtaat	gagagatcca	240
aacaccaagc	gctccagggg	ctttgggttt	gtcacatatg	ccactgtgga	ggaggtggat	300
gcggctatga	atgcaaggcc	acacaagggt	gatggaagaa	ttgtggaacc	aaagagagct	360
gtctccagag	aagattctca	aagaccaggt	gcccacttaa	ctgtgaaaaa	agatatttgg	420
tggtggcatt	naagaagacc	ttgaagaaca	tcacctaaga	gattatttgg	acagtatgga	480
aaattgaatg	attgaaatca	tgacttgacc	aagcatggcc	aaaaaagggc	tttgctttga	540
accttgagac	atgattcngg	ataaaatgcn	tcnaatnctt	ntggga		586

<210> 280
 <211> 612
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(612)
 <223> n = A,T,C or G

<400> 280
 actttttttt tttttttttt ttttttcttt tttttttttt tttttttttt ttttgaaaaa 60
 gtcataaagg ccatgggggt ggcttgaaac cagctttggg aggttcgatt ccttcctttt 120
 ttgtctaaat tttatgtata cgggttcttc aaatgtgtgg taggggtggg ggcataccata 180
 tagccactcc aggtttatgg agggttcttc tactattagg acttttcgct tnaaaacgaa 240
 ggcttntcaa atcatgaaaa ttattaatat tactgctgtt anaaaaatga atgagcctac 300
 anatgatagg atgtttcatg gggngtatgc atcggggtaa tccnaataac gtcggggcat 360
 tccggatagg cccaaaaang tttntgggaa aaaaagttn atttaccccc attaaattta 420
 tnnnnaaaag ggattttgcc taagggtggg ctaagggggg ancccngaaa attgggggaa 480
 atcangnaat gaaacccct ntgatggna aaaacagctc ctnttggttg ggccttatng 540
 ggaannggg ttcaactan naccttnggc ggnaaaacc ttangngaa ttnnnnncaa 600
 ntggggggg tn 612

<210> 281
 <211> 593
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(593)
 <223> n = A,T,C or G

<400> 281
 acgctgcttc ttcagagcaa tacgccgccg tttgtgctgc aggacacgtg gagtaacaag 60
 acgctgaatc ttgggtgctt tggctcctagg tttcttacct tctttattta agggctttct 120
 tacaacatac tggcggacat catcttcttt agagagattg aaaagtgtgc ggattctgct 180
 agctcttttg gggcccaggc ggcgaggcac tgtagtatca gtcagtccag gaataccctt 240
 ctctcctttt tttacaataa ccaagttag aacgctcaga tttgcatcca caatgcaacc 300
 acgaactgat tttctctttc tttctcagtt ctcttggtc tgtaacagga atgcccctta 360
 ctcaatanca ggcggacacg ggcattgggtc aagacaccct gcttcattgg gaaaccttg 420
 ttgncgttcc accactggat tcggaccaca taaacctttc attcttnaac caaacgtaac 480
 ancaactttt gngggccata cncctttata naaagtcgg ggganaagtn ttttgaggga 540
 caagcctgta acnaatagtn aaatcccggg tttggattcc taancctttt ccn 593

<210> 282
 <211> 595
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(595)
 <223> n = A,T,C or G

<400> 282
 ggtacaattc aagaaactaa gtatttatgg gcattgaaga aaaaatgttg agataaaatt 60

gctgtgcaga	aaaaagtgtt	aatgaagccg	acctgactac	ttaaccttag	agacctgctt	120
tacaagggtg	gcccttgatt	ggcatctggg	aacttggagt	tcagggggct	tccaccattc	180
ccagaactga	tcaaagtagc	ttactatatc	taaactgtaa	aacaatatag	tttctcctga	240
acacctgctt	tccttctggg	agtctggaat	tttgggtatgt	gccaggcaga	gactaccttt	300
gtgaccagct	cccagtaaaa	accccaggca	ctcagtctct	aacaagcttt	tctgggtgac	360
agtgtttcac	aagtgtctgt	acaactgggt	gctggggagaa	ttaagctcat	cctctgtgat	420
tccactggcc	gaggattcct	ggaagcttgc	acttaagttt	cccctgactt	caccccatgg	480
gcttttttcc	ttgctgattt	ggtttgnatc	cttcctgnat	aaatcatggc	ctgaaccnaa	540
cttgaaaaaa	aaannnnnnn	nnaaaaaaaag	gtnccttgccc	ggcggccgtt	naaat	595

<210> 283
 <211> 348
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(348)
 <223> n = A,T,C or G

<400> 283	
actttttttt	tttttttttt
ggtanagggg	gtgctatagg
attntaggac	gatgggcatg
agtatacccc	cggtcgtgta
ctgtttttta	gcctaattgtg
ttatacgaat	gggggcttna
tttttttttt	tttttttttt
gtaaatacgg	gccctatttc
aaactgtggt	ttgctccaca
gcggtgaaag	tggtttggtt
gggacagctc	atgagtgcaa
atcgggagta	cctnggccgn
ctntanaggg	aaagattttt
aggggaatta	natttcanag
cattgaccgt	ggaattgcat
gatgtaatta	naccacnc

<210> 284
 <211> 563
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(563)
 <223> n = A,T,C or G

<400> 284	
ggtacccatt	aatttgctca
taagaatggg	ttctaacgta
tggagggcag	taaacattct
ggtaaatgta	gaatagagat
aaatcatatg	attacatttt
tttttttcatt	tgaaggtaat
aatcctattt	atctaaaaca
cagccgcccc	ttcatatcat
aagtcaacan	gggtttggaaa
cctgcccnng	cggcggtten
gatatagcag	gcttaatggg
ggagagggaa	aacatccacc
ttacacccaa	aacctatggc
ggtctaaaca	cagctaggac
gcacaaaaac	caaatagaaa
ttaaattcac	aaatgcta
acacacaaat	tatctattct
tggggggagaa	atagattncc
ttagccaaat	tcataccaaa
caaaagtgtt	agaaatttaa
atttgaccaa	taacacacta
ttttgagatt	tttaataccc
ctccacatgt	cttaaaactgc
tacccgggta	

<210> 285
 <211> 422
 <212> DNA

<213> Homo sapiens

<400> 285

acaatggact	ggatactaga	aattttcttt	tcactcaaca	gaacataggc	atcctggaat	60
tcacatttct	gaccttttga	tgtattaata	aagtatggag	aaatatagcc	tcgatcaaac	120
ttcatgcctt	caataatttc	taattcatca	ttcagtgttt	ttccatcctt	tactgtgatg	180
acaccctttc	ttccaacttt	tttcattgca	tcagagatga	tattgccaat	ttctttgtct	240
cgttttgag	aaatcgtagc	aacctgtgca	atttcttcag	gggtgggcac	aggtttagac	300
tgctttttaa	gttcagcaat	tacagcatca	acagctaaca	tcacacctct	cctgatttcc	360
actggattag	cacctttgct	aatcttctcg	aagccttctt	ggctatagag	cgtgccagta	420
cc						422

<210> 286

<211> 588

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(588)

<223> n = A,T,C or G

<400> 286

actgttcctg	cagggttaagg	caggactgga	actcctccac	agcttgcaca	tagttttcag	60
attcaacact	aacttctccg	agtttaagat	gtgcctgggc	agcataaagc	tgtgcttctt	120
ttgtttcttg	ccttttaaaa	atgatctttg	ctaaatccag	catatcccag	gcaagctcta	180
ggttcccaat	ctcctcctcc	tcattttctt	gaagagactt	gttttcaagg	actgaatcat	240
ttggcatttc	ttcggcttta	tcattttctt	tatcatectc	ttctgagcct	tcagtttcat	300
ctatgttatc	attattttct	accagagatt	catcttctgn	tnttttctcc	ttcttctctt	360
tncacatgca	caccttccaa	ggcgtttcca	acacaccatt	cttcatcttg	ccaacttcag	420
aagtggattt	ccatagaaaa	agaangnttn	ttcacactta	ttaactgctc	ttcatacttt	480
ttacctnaaa	gactaactgn	ttcctggaat	gcattggcgc	ctgctnggaa	atccccatan	540
cngaagtnt	ggcctaancc	aaagtntnta	gttactttcc	catccgac		588

<210> 287

<211> 583

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(583)

<223> n = A,T,C or G

<400> 287

actggaactc	caggaagcgc	tggccagcct	catacgggag	ccatttttct	ttcactgcct	60
ctgctgctga	catcttcttc	tttcccttca	cacctctgaa	gcctatgaag	gctttctgag	120
caggcttcag	cctgggtggc	atgtcttggg	caatcacacc	ctgggagact	gcgtcctgaa	180
gtgacagctt	ctggcccgtg	gttgggtgga	tgatgccacc	tgtgcaggcc	tgagcctcca	240
gaagcctctg	acccgtgatg	ctgtcaacga	tgccccgctc	tataccttct	gtaatggaga	300
ttttctccag	gttttctgtg	tcaaagatgg	ctgcaatggg	gctcgattct	tncaggggtg	360
ctgaaaaaga	actgctcctt	atggntaaat	tcttgacctg	gatatggtgg	aaatcttact	420
tactgattca	tgtcgggagc	tgctaaaaac	atnategttg	caccactggc	catgctgtgn	480

```

ttgnggccac accatttttn angngacatg taacnaattg antaggttag ntccgaacg 540
gaccttggcc ggaacaccta agngatcan ncatggggcg tnn 583

```

```

<210> 288
<211> 607
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc_feature
<222> (1)...(607)
<223> n = A,T,C or G

```

```

<400> 288
gggtacttttt tttttttttt tttttttggt atttagtttt tatttcataa tcataaactt 60
aactctgcaa tccagctagg catgggaggg aacaaggaaa acatggaacc caaaggggaa 120
tgcagcgaga gcacaaagat tctaggatac tgcgagcaaa tggggtggag ggggtgctctc 180
ctgagctaca gaaggaatga tctgggtggt aagataaaac acaagtcaaa cttattcgag 240
ttgtccacag tcagcaatgg tgatcttctt gctggtcttg ccattcctgg acccaaagcg 300
ctccatggcc ttcacaatat tcatgccttc tttcactttg ccaaacacca catgcttgcc 360
atccaaccac tcagtcttgg cagtgcant gaaaaactgg gaaccatttg ggggtggggtc 420
cagcattttg catggaccan aatgccagga cccctatgct ttaaggatga anntcttatn 480
ttnaaatttc ttcccataaa nggcttgcca ccaangccat tatngcgngt gaagcaccac 540
ctgacccata accctggaat aattntnnga aaaccggacc cttntaccna atcttttttc 600
agggggnn 607

```

```

<210> 289
<211> 591
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc_feature
<222> (1)...(591)
<223> n = A,T,C or G

```

```

<400> 289
actttttttt tttttttttt tttgagaatg aataagcagt tctttaatgg ttattttaat 60
atattccaga agagcgttta taattcattt acaagtgcag tattgcgcta gtaaatgtta 120
cttgacctct tgtataaata atgccgatta agaattagtc ctggaatagt ttccgaattt 180
ctaactctgt agatctaaaa cacaattgta aatggtataa agatgtaaga atcatattgt 240
gataaagtca atctcaaaaa tagagaatcc agacccttcc cagataattt aagaactgag 300
ttttcctcaa cttaaacatg atggccacac agaaaacagt aaagacactt ttcgatgtga 360
tacaactgga taaaactcga gaatatgagt atttagngac caatgnatan acattantgg 420
aattttaaaa ncccttttaa tctgaagccg aaaaaaangc cattttccaa gaattattgn 480
gccctaatac tcactnannc nngaatannc tncnttcccn ggatagnnnn nnntccnct 540
tnggaaantg ggcnaantt ntttggtntn aaagggggnc cnttaantcc n 591

```

```

<210> 290
<211> 592
<212> DNA
<213> Homo sapiens

```

<220>
 <221> misc_feature
 <222> (1)...(592)
 <223> n = A,T,C or G

<400> 290
 ggacttggaa atgggtgtct ggaaagcttc cactttgggtc ttgacggcat tcaccctctc 60
 cagcaccttc tcttgattg ctaccccaaa atcatttcca tcttcaatct tggggatcag 120
 gtgttggatc catgtaatca ccagaatgca tttctctttg agagtccaga cttctggctt 180
 aaccagggca agcagggaca ggactttctc attcccaggg agaaatccac acttagggac 240
 ttctttcttc tctgcttat ctgtttccat ctcacatcc ttgggtggag ggtctgggat 300
 ggggatgtcc agtggggccc ggagggaagt caagtcagcc acattgaggg agtcctcttg 360
 caagagctga ttcaggtata tgattttctg tggcaagaat ctgtagagga attcctcanc 420
 ctntctgaaa agaactctgtc tgaagacctt cacctgggtg cgggctttcc cgctaagcgc 480
 accccacacg gtttgggcct gctgntttta tcttaanct ctggcttccg gntagtcccc 540
 cgggaccttg ccggccggcc ntcaaagggc aattcancna ctggcgccg tn 592

<210> 291
 <211> 609
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(609)
 <223> n = A,T,C or G

<400> 291
 acagtggcat gatctcggct cactgcaacc tctgcctccc ggggttcaagc aattctcctg 60
 cctcagccac ccaagtagct gggactacag gtgcgtgccca ccacgcccag ctaaattttg 120
 tatttttagt ggagacgggg tttcaccatg ttggccagga tggctcfaat ctctgaccc 180
 tgcgatctgc ccacctcagc ctcccaagt gctgggatta caggcgtaag ccaccgggcc 240
 tggcctgttt tatgattctt aatagttact tggtttaaat cacatttgat actatccttc 300
 tgaaaagtct gagacagatc taaaaactac agtcaaaatt atagattaag aggaatgaat 360
 gcacctattt ggctttaagt tgaagatgaa ttattttctca tgctcatttt cttgcngcag 420
 ttatcttaga aagaccccca aaggcttggtg attgtaaagc acttgcatga tcacagaatg 480
 caagcttctg gtaccttcgg ccgtgacacg ctaagggcga attcatcaca attgcgggcc 540
 gtacctatgg atccannctc ggtccaactt ggcggaatca tgggcatact gnttcctggn 600
 nnaaatgtn 609

<210> 292
 <211> 568
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(568)
 <223> n = A,T,C or G

<400> 292
 actgcccaga aggagttcat aaagaataca aagaagaccc caaaagatgt cacgatggca 60
 ctattgaatt cagcagcatc gatgcacaca atgggtgtggc cccatcaaga cgtggtgatt 120

tggaataact	tggttattgc	atgatccaat	ggcttactgg	ccatcttcct	tgaggagata	180
atttgaaaaga	tcctaaatat	gttagagatt	ccaaaattag	atacagagaa	aatattgcaa	240
gtttgatgga	caaagtgttt	cctgagaaaa	acaaaccagg	tgaaattgcc	aaatacatgg	300
aaacagtgaa	attactagac	tacactgaaa	aacctcttta	tgaaaattta	cgtgacattc	360
ttttgcaagg	actaaaaact	ataggaagta	agggtgatgg	caaatggac	ctcaatgggtg	420
tggaatgg	angnttgaaa	gccaaaacca	tnnnnaaaaa	ncttagggcg	aattccannc	480
actggcgcc	gtncatangg	atccagcttg	gncccaactt	ggggtaatca	tgggcataac	540
tggtncctgg	ggaaaatggt	ttcccnnn				568

<210> 293

<211> 603

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(603)

<223> n = A,T,C or G

<400> 293

ggtacttttt	tttttttttt	tttttttttt	tttttttctt	tttttttttt	tttttngcct	60
ttttaaaaa	cttttatattg	agnggntntt	acaaanattg	nngcaatatg	aaagtcattt	120
gtttgatana	aatatcaagc	tgncctgtca	aacacnctga	agtaacccaa	aaatntnttt	180
caaagctcac	anagcttaaa	aagagcnaag	attntntgca	accagacaaa	acctatttnt	240
gcatttccta	tttctttctn	aaactgnttt	gcctaccaaa	ctttnacgtt	taaacatttt	300
caggaaatgc	agggatcatt	ttgtttggaa	ttttaagacc	ccccngaacn	cataggtntt	360
tacaaagaaa	cttttcccga	tcccttaatt	gaaaagaacc	ntccnaaata	taaantttgn	420
aaactccent	ttttggccaa	ttgatcanaa	tgccagaaga	natgctaacc	naanagccct	480
ttaactgggc	tgggattcca	taccctaaan	gggggtttcaa	aactgggttaa	ccttnnccca	540
attttaacct	tngggaaaag	ggnaaaggan	ccccggggna	aaaataaggt	tttgaaaaat	600
aaa						603

<210> 294

<211> 617

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(617)

<223> n = A,T,C or G

<400> 294

ggtacgcggg	gategettcc	tggtcctcgc	ccccctcgct	gtctccctgg	agttcttgca	60
agtcggccag	gatgtctcag	gctgagtttg	agaaagctgc	agaggagggt	aggcacctta	120
agaccaagcc	atcggatgag	gagatgctgt	tcatctatgg	ccactacaaa	caagcaactg	180
tgggcgacat	aaatacagaa	cggcccggga	tgttggaactt	caagggaag	gccaagtggg	240
atgcctggaa	tgagctgaaa	gggacttcca	aggaagatgc	catgaaagct	tacatcaaca	300
aaagtagaag	agctaaagaa	aaaatacggg	atatganaga	ctggatttgg	ttactgtgcc	360
atgtgtttat	cctaaactga	gacaatgcct	tgtttttttc	taataccgtg	gatgggtgga	420
attcgggaaa	ataaccagtt	aaaccagcta	ctcaaggctg	ctcaccatac	ggctctaaca	480
gattaggggc	taaaacgatt	actgactttc	cttgagtagt	tttaatctga	aatcaattaa	540
aagtggattt	tgtacacaaa	aaaaaaaaaa	aaaaagtnct	gcccggccgg	ccntcaaaaag	600

gcnaattcan ccccttg

617

<210> 295
 <211> 606
 <212> DNA
 <213> Homo sapiens

 <220>
 <221> misc_feature
 <222> (1)...(606)
 <223> n = A,T,C or G

<400> 295
 cgagggtactt ttaccatgaa catctctaga ctgtgattat taaatatagt gataatatac 60
 atggggtttac tgggatattg aaaaataaaa gataatgaac ccaatttagt aaatcaacat 120
 aaatacaaaa cagagcgaat tagccctcta caactgagct cgtcctgcgt cttgagcttg 180
 gggtctttct ggaactgtct caaaccttag tgggggaagt gaccttatcc acagattgct 240
 tttcccagag gttccgcttg ctggatacgt ctctgggtct caagtcagaa ggtttgggag 300
 cagggtgactt gtttccatct ggggttttag ttagccattc attgatgccg ctagaaaccc 360
 ctaccttcaa gccagcagtt tccttatttg gtgtgcctgc tgcantgggg gatgaaaaca 420
 cattccttcc tncacatac tcttggatgt tgcgtacctg ccnnggcngg ccgttcnaaa 480
 ggccaattcc acaccactgg cggccgtact aatggatcca aaactcggac cancttggcg 540
 natcatnngc atactggttc ctggggnaaa tggattccgt tacattcccc caacttccag 600
 ccnngg 606

<210> 296
 <211> 612
 <212> DNA
 <213> Homo sapiens

 <220>
 <221> misc_feature
 <222> (1)...(612)
 <223> n = A,T,C or G

<400> 296
 ggtacgcggg gtgccagagg aaatcttaaa gcgcctactt aaagaacagc acctctggga 60
 tgtagacctg ttggattcaa aagtgatcga aattctggac agccaaactg aaatttacca 120
 gtatgtccaa aacagtatgg cacctcatcc tgctcgagac tacgttggtt taagaacctg 180
 gaggactaat ttacccaaag gagcctgtgc ctttttacta acctctgtgg atcacgatcg 240
 cgcacctgtg gtgggtgtga ggggttaatgt gctctgtcc aggtatttga ttgaacctg 300
 tgggccagga aaatccaaac tcacctacat gtgcagagtt gacttaaggg gccacatgcc 360
 anaatgggcc cgcaggaagg ccgtcaagaa nggctcgacc cggntgggtg ttcaagggaag 420
 aaacattgtg gtcttgggtg ggaaaaaaaa tcantgggcc aactggngga tgaaagacna 480
 tgccggaana nctgggcttt ggatgacaac ccctgcatgg gcttttgang ccttaccgcc 540
 gatccagggt tntnttaaca nggcccgggt gaatgccnaa nccccgggta ctttggagga 600
 cccggtncct gg 612

<210> 297
 <211> 590
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(590)
 <223> n = A,T,C or G

<400> 297
 acgcggggga acacatccaa gcttaagacg gtgagggtcag cttcacattc tcaggaactc 60
 tccttctttg ggccacggaa ttaacccgag caggcatgga ggctctgct ctcacctcat 120
 cagcagtac cagtgtggcc aaagtggta ggggtggctc tggctctgcc gtagttttgc 180
 ccctggccag gattgctaca gttgtgattg gaggagtgt ggctgtgcc atggtgtca 240
 gtgccatggg cttcactgcg gcgggaatcg cctcgctcct catagcagcc aagatgatgt 300
 ccgcggcggc cattgccaat ggggggtggaa ttgcctcggg caaccttgtg gctactctgc 360
 agtcactggg aacaactgga ctcttcngat tgaccaagtt catcctgggc ttcattgggt 420
 ctgccattgc ggctgcattg cnaggtctac taacttcctg cccttgccctt gcaaaaaaaaa 480
 aaaccttgcc agggaaaaag nccccaancc ttctgaacca accanggggc ccacttttcc 540
 aaaatacctn gggnggaaaa tncccaattt tgantttcnn aggaaanana 590

<210> 298
 <211> 590
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(590)
 <223> n = A,T,C or G

<400> 298
 ggtactttga gccactctcg catggaaagg agtgtcttta tgccctcgacc tcaagctgtg 60
 ggctcttcca attatgcttc caccagtgcc ggactgaagt atcctggaag tggggctgac 120
 ctccctcctc cccaaagagc agctggagac agtgggtgagg attcagacga cagtgtattat 180
 gaaaatttga ttgacctac agagccttct aatagtgaat actcacattc aaaggattct 240
 cgacccatgg cacatcccga cgaggacccc aggaacactc agacctccca gatttaacta 300
 aacaaaagaa actctccacc tagcactgtt tttcttcatt gcttactgag agggtttttg 360
 agaacttaat ctggggggag aactgcttct tcagatcctt aactcccgag aagagaagtc 420
 cttgtgcaca gaacttgttg gaaccttcat ccgntgtctt taccttttga tccagtgtgc 480
 aagtttcatg acngaatcat taagatatca aatggcctaa tttggngcna atcatggtat 540
 actgggaaaa ttaggcnaat ggaacttntc accgantttg gtcttttaan 590

<210> 299
 <211> 549
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(549)
 <223> n = A,T,C or G

<400> 299
 cgaggtacaa agatctgaca tgtcaccag ggacccattt caccactgc tctgtttggc 60
 cgccagtctt ttgtctctct cttcagcaat ggtgaggcgg atacccttct ctcggggaag 120
 agaaatccat ggtttggtgc ctttgccaat aacaaaaatg ttggaaagtc gaggggcaaa 180

gctgttgcca	ttggcatcct	tcacgtgaac	cacgtcaaaa	gatccagggg	gcctctctct	240
gttgggtgatc	acaccaattc	ttccttaggtt	agcacctcca	gtcaccatac	acagggttacc	300
agtgtcgaac	ttgatgaaat	cagtaatctt	gccagtctct	aaatcaatct	gaatgggtatc	360
attcaccttg	atgaggggat	cggggtaacg	gatgggtgcg	gcacatgag	tcaccagatg	420
anggattcct	tttgtgcccc	caaagatctt	tctactttgc	ancacacact	ggcggnctga	480
ctagtggatc	cacttcgnac	caacttggcg	tatcatgggc	tnactgggtnc	cgggggaaat	540
ggtatccnn						549

<210> 300
 <211> 591
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1) ... (591)
 <223> n = A,T,C or G

<400> 300						
actccagcct	gggcgacaga	gcaagactcc	acctcaaaaa	agaaatattt	agcaaattatt	60
aaaggacaag	agggaatatc	tgtttaaaaa	attataatgc	acgttagatg	aaaagtaata	120
ggatgagatg	gttgttgctg	aaatagcact	tgctatataa	attcaaactc	tccttttcaa	180
attcagcttc	tcagaggttt	gacttcagat	gcttgagcac	tttcaacatt	atctttgcct	240
ttatccttcn	ttatgcggat	aaacacaact	gctaaaatta	taccattgat	tttggaact	300
tcccagtcgt	tttgttaagc	tcactgccga	gggaaaatgt	aaaatgggga	ccccgaaata	360
aagtgtgat	catcatcaag	tagcctcgaa	aatgagactt	tcaggtgcac	tgaaggggat	420
ggcagaagaa	caagccccgt	gtagtccttg	ctagcctggg	aagggtggca	ttcacatcct	480
taaggatcan	gtggactttg	acnccgaact	taaaggaaga	accccttatt	ntggggccac	540
cacttgacct	tgggcccga	cacccttaag	gcgaattcca	cacactgggg	g	591

<210> 301
 <211> 655
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1) ... (655)
 <223> n = A,T,C or G

<400> 301						
cgagggtactc	tttaaaaagg	gactgcaggg	ctgggtgtag	tggtcacac	ctgtaatccc	60
agcacttttg	gaggccaagg	cagggtgggtc	acttgaggcc	aggagtttga	gaccagcctg	120
accaacatgg	caaaacccca	tctctactaa	aatacaaaaa	ttagctgggc	atgatggtgc	180
actcctgtaa	tcccagctac	ttggtaggct	gaagcatgag	aattgcttaa	acctgggagg	240
cagaggttgc	agtaagccaa	gatcatgcc	ctgcactcca	gcctgggcaa	cagagtaaga	300
ctctgtctta	ataaataaat	aagaaaataa	aacggaactg	cagtgcctaac	agtaatttat	360
acatttttaa	atgttctgag	tatgttttga	ctgggttagt	gtaacaatat	actaccctga	420
aaagtgcagt	tttgattgtt	gggtgtgtct	ttgggtcang	aaaagtgaac	tgtgccaaaga	480
agtatttttc	aatgacatga	atggattnct	gttaatgcaa	ttgactgaga	aaatgngctt	540
acgctttctt	aactgcaaaa	agagntttgt	ccacatcana	attgttgaaa	ctggngctgt	600
ttctgttgcc	tgggatctga	tgactgggat	ttcctcttgg	acaaaanacc	tgatn	655

<210> 302
 <211> 513
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(513)
 <223> n = A,T,C or G

```

<400> 302
actcgtcttg gtgagagcgt gagctgctga gatttgggag tctgcgctag gcccgcttgg      60
agttctgagc cgatggaaga gttcactcat gtttgcaccc gcggtgatgc gtgcttttcg      120
caagaacaag actctcggct atggagtcct catgttgatg gatcctgagc ttgaaaaaaaa      180
actgaaagag aataaaatat ctttagagtc ggaatatgag aaaatcaaag actccaagtt      240
tgatgactgg aagaatatcc gaggacccag gccttgggaa gatcctgacc tcctccaagg      300
aagaaatcca gaaagcctta agactaagac aacttgactc tgctgatttt tttttccttt      360
ttttttttta aataaaaata ctattaactg gacttcctaa tataacttc tatcaagtgg      420
aaaggaaatt ccaggcccat ggaaacttgg atatgggtaa attgatgacc aataatcttc      480
acttaaagnc atgtcctttg gccgcgaaca cgc                                     513
  
```

<210> 303
 <211> 610
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(610)
 <223> n = A,T,C or G

```

<400> 303
acgcggggct tgcagagccg gctccggagg agacgcacgc agctgacttt gtcttctccg      60
cacgactgtt acagaggtct ccagagcctt ctctctcctg tgcaaaatgg caactcttaa      120
ggaaaaactc attgcaccag ttgcggaaga agaggcanca gttccaaaca ataagatcac      180
tgtagtgggt gttggacaag tnggtatggn gtgtgctatc agcattctgg gaaagtctct      240
ggctgatgaa cttgctcttg tggatgtttt ggaagataag cttaaaggag aaatgatgga      300
tctgcagcnt ggggagctta tttcttcana caccttnaaa ttgtgggcag atnaagatta      360
ttctgtgacc cgtcaattct tanattingta gttggtnact gcatggaatt cngtcagcaa      420
gaaangggaa aantctngtt caatttggtg gnataagaan tggttaatgg tcttcaaatt      480
cnttattcct tcagancggc caagtacctn ggccgnganc atgcctaagg gctaattcna      540
ctcantggng gccgntctan ntggattcca ncttgggtacc aancttgngn ntattnatgt      600
caatanctgg                                     610
  
```

<210> 304
 <211> 596
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(596)
 <223> n = A,T,C or G

```

<400> 304
ggtacctgga attatctaatt tggccagagg tggcgcccga cccatcagtt cgaaatgtag      60
aagtaataga gttggcaaaa gaatggaccc cagcaggaaa agcaaagcaa gagaattctg      120
ctaagaagtt ttattctgaa tctgaggaag aggaggactc ttctgatagt agcagtgaca      180
gtgagagtga atctggaaag tgaaaagtgg agaacaaggc cgaaagtggg ggaggaagga      240
gacagcaatg aggacagcag tgangactcc tncagtgagc angacagtga gagtggacgg      300
gagtcaggcc tagaaaacan angaacagcc nagangaact caaaagccaa agggaaaaag      360
tgattctgaa gatggggaga aggaaaatga aaaatctaaa acttcagatt cttcaaataa      420
cgaatctagt tcaattanaa gacagttctt ccgattcttg aatcagaatc agaacctgaa      480
agtgaatctt gaatncngaa cagtcgctta ggagaaagaa agaaaccaag caggattgac      540
tccttttnc aagntgttcc ttctaaactg gatgatttaa ccngntccct cagtgn          596

```

```

<210> 305
<211> 629
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc_feature
<222> (1)...(629)
<223> n = A,T,C or G

```

```

<400> 305
ggtactttnt tttttttttt tttttttttt tttttttttt tggggattta ntttttatatt      60
cataatcata aacttaactn tgcaatccan ctaggcatgg gagggaacaa ggaaaacatg      120
gaacccaaag ggaactgcag cgagagcnca aanattntng gatactgcga gcaaattggg      180
nggaggggng ctntcctgag ctacaaaagg aatgatctgg tggntaaaat aaaacacaag      240
tcaaacttat tnnagttgtc cacagncagc aatggngatc ttcttgctgg ncttgccatt      300
cctggaccca aagcgcctcca tggcctccac aanattcatg ccttctttna ctttgccaaa      360
caccacatgc ttgccatcca accactcant cttggnagng cagatgaaaa actgggaacc      420
atttttnttg ggtccnacat ttccatggca aaangccang acccnttgct ttaagaagaa      480
aatctcatct tcaaattctn ccctaaanga cttgccncan gccntntggg tgngaagcnc      540
ccctgncca taacctgga tatttttgaa agaggancct ntacnaacnt ttttcenggt      600
aanaaaaaat tttttnttg acctnccca                                629

```

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<210> 306
<211> 643
<212> DNA
<213> Homo sapiens

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<220>
<221> misc_feature
<222> (1)...(643)
<223> n = A,T,C or G

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<400> 306
acagggagga atttgaagta gatagaaacc gacctggatt actccggtct gaactcagat      60
cacgtaggac tttaatcggt gaacaaacga acctttaata gcggctgcac catcgggatg      120
tcctgatccc ccgcgtacat ttctttgtag actctgttaa ttctctgcag ctcttggttg      180
gttctggagc agatgatctc aatgagagag tcctcgctcg ttcccagccc cttcatggaa      240
gcttttatct cagaagcgct atactgagca ggtgtnttca ataggcccaa aatcaccgtc      300
tccaggtggc cagataaggg tgacttcaat gctgatgcaa gntccttttt ggtccttctc      360

```

tggtaggcga	aggnaatatc	ctgtctctgt	ncattgcttg	cggntgggca	aaatgttgac	420
aatggtgacc	tcatccacac	ctttggtctt	tgatggntgg	ntcaatgttc	aaagcatccg	480
ctcagcatca	aaantaagta	tangctttgc	agacccatat	gcacttgggg	gngnngagng	540
acaccctcca	actgaacttg	ccaggatttn	tgaaagtaan	anttttaaga	acttgccgnc	600
cccanactaa	acnnccaatc	tagcccnntn	cctaacggcc	aag		643

<210> 307
 <211> 643
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(643)
 <223> n = A,T,C or G

<400> 307						
cgaggtactt	tttttttttt	ttttttttnt	ttnttnttnn	tttggggatt	nantttttat	60
ttcataatca	taaacttaac	tctgcaatcc	aactaggcat	gggaggggaa	aaggaaaaca	120
tggaacccaa	aggggaactgc	ancgagagca	caaanattct	nggatactgc	gancaaatgg	180
ggnggagggg	tgctctcctn	agctacaaaa	ggaatgatct	ggtgggttan	ataaaacaca	240
agtcaaactt	attcnagttn	tcacacagnca	gcaaagggga	ncttcttgnt	gggcttgcca	300
ttcctggacc	caaaacgctc	catggnectc	caaaatttat	gccttttttt	actttgccaa	360
anaccacatg	ctttgccttc	caccnctcan	tttttgnggg	ggnaaataaa	aancgggaac	420
cnnttggtgt	tggncnaca	ttttccnttg	gnaaaaaacc	ncgaccctt	tnnttaagaa	480
naaaatttta	nttttaaaat	tttcccctaa	aaaggactgg	cccnaaggcn	ttttgggggn	540
gaagcccncc	ntccccnaaa	cctggaaaaa	ttttggaagc	nggacccttt	accaaattct	600
tnctctggtt	aaaaaaaaat	tttttttttt	gacctttccc	aan		643

<210> 308
 <211> 653
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(653)
 <223> n = A,T,C or G

<400> 308						
cgaggtacag	agagtagctt	ctgtgatgca	agaatatact	cagtcaggtg	gtgttcgtcc	60
atlttgaggtt	tctttactta	tttgtggttg	gaatgagggg	cgaccatatt	tatttcagtc	120
agatccatct	ggagcttact	ttgcctggaa	agctacagca	atgggaaaga	actatgtgaa	180
tgggaagact	ttccttgaga	aaagatataa	tgaagatctg	gaacttgaag	atgccattca	240
tacagccatc	ttaaccctaa	aggaaagctt	tgaagggcaa	atgacagagg	ataacataga	300
agttggaatc	tgcaatgaag	ctggatttag	gaggcttact	ccaactgaag	ttaaggatta	360
cttggctgcc	atagcataac	aatgaaagtg	actgaaaaat	ccagaatttc	agataatcta	420
tctacttaaa	catgttttaa	agatggtttg	tttgcaagac	tttttgcata	cttanttcta	480
catgaattaa	atcactgggt	tnaaatgaca	cttattaatc	ctaataactg	gtnaaccnc	540
aaaaaaaaaa	aaaaaaaaaa	ntacttnccc	ggcgcccgct	gaanggcaat	tcacnccctg	600
cggccgtcta	tggatccacc	cggncacact	gggnaacagg	cnactgggtc	tgg	653

<210> 309

<211> 649
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(649)
 <223> n = A,T,C or G

<400> 309
 acttgcaaaa gcacttgaag tcattaaacc agctcatata ctgcaagaga aagaagaaca 60
 gcatcagttg gctgtcactg cataccttaa aaattcacga aaagagcacc agcggatcct 120
 ggctcgccgc cagacaattg aggagagaaa agagcgccct gagagtctga atattcagcg 180
 tgagaaagaa gaattggaac agaggggaagc tgaactccan aaagtgcgga aggctgagga 240
 agagaggctg cgccaggaag caaaggagag agagaaggag cgtatcttac aggaacatga 300
 acaaatacaa aagaaaactg tccgagagcg tttggagcag atcaagaaaa cagaactggg 360
 tgccaaagca ttcaaagata ttgatattga agaccttgag gaaatggatc cagattttat 420
 catggctnaa cagggtgaac aactggagaa agaaaagaaa gaacttcaga acccttaaga 480
 atcagaaaag aagattgctn ttttgaagac ccacctttgg aaaaattcct ttgttaagag 540
 cctttcgagg acagaaaatt aagacatggg ctggggngcc cccgaggaga aagaattctc 600
 ctgcccttga cgtgaaaggt nttgcataaa atcatgtccn atcttgaga 649

<210> 310
 <211> 319
 <212> DNA
 <213> Homo sapiens

<400> 310
 cgaggtaacta gccggacttg gattttcttg aaagatttca gttgaggaac gggaacaaag 60
 attatgatag ctttccgacc accaccaact tcaatttcct tagctgccgt aatattcagc 120
 tccctgagct gagccttgag gtccgagttc atctccagct ccagaagagc ctgggagatg 180
 ccggactcga actcgtccgg cttctcgcca ttgggcttca cgatcttggc gctcgaactg 240
 aacatggctt tctcctggga gaacttgccg agcgccggct taggaagaga ccccgcgctac 300
 ctgccgggagc ggcgctcga 319

<210> 311
 <211> 646
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(646)
 <223> n = A,T,C or G

<400> 311
 cgaggtaactg atgcaacagt tgggtagcca atctgcagac agacactggc aacattgcgg 60
 acaccctcca ggaagcgaga atgcagagtt tcctctgtga tatcaagcac ttcggggttg 120
 tagatgctgc cattgtcgaa cacctgctgg atgaccagcc caaaggagaa gggggagatg 180
 ttgagcatgt tcagcagcgt ggcttcgctg gctcccactt tgtctccagt cttgatcaag 240
 ctgcacatca ctangattt caatgggtgcc cctggagatt ttagtggtga tacctaaagc 300
 ctggaaaaaa ggaggtcttn tntggcccca aaccaatgtt ctgggctggc caatgacttc 360
 acatggggca atggcaccaa caccggcaga acttgnacce tattgccaca acatgtcctt 420

atctnaatga	nggncttctt	tgtgaaaaca	aaccccatc	cccggaatta	agnacaantt	480
cttcaaactt	gggtggnttc	aagggcctcg	atngcctgcc	catatngggg	ttttgccata	540
aaacacaacn	ttccnnaaag	gaatccgant	nttggtttgt	tggancccat	ttttgttccc	600
aagaaaattn	ggtaatatcc	aaattgggga	attaggaaaa	tgggnt		646

<210> 312

<211> 622

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1) ... (622)

<223> n = A,T,C or G

<400> 312

cgaggtactt	ttgtgagagg	gttcaatggg	agagctttaa	tgcagatgag	acttgaagct	60
tctgaagaag	atctaagtct	tgatgagggt	attcaaactc	aaatcttgaa	tgcataatga	120
tgataggcca	tggtcttcaa	aaacgtggta	cttttaatag	caacaggggt	tcaccatggt	180
ggccaggctg	gtctcaaatt	cctgacctca	agtgatctgc	ccacttaagt	gctgggatta	240
caggcatgag	ccacaacatc	tggccagaaa	tattttttct	tttctttctc	tttctctctc	300
tctttttttt	tttttttttt	tttggagctc	gctctgtccc	ccagctgcaa	tgcaatgggg	360
caatcttaac	ttactgnaac	ctcccccttc	aggtcnaaag	aatctttgng	ctacctecta	420
natntnggaa	tacaagggcg	tccccacct	actaattttg	ntttttaaga	aaaggagggt	480
ttancatggt	ggtnngntga	tcccaacctc	cgaccttaan	gancctccgc	ctaatttcca	540
aaggctggat	nttggctgan	cccacccnc	ttaacaaaaa	ttnaaattct	ttnttctgc	600
cgggggcgtt	aaagggaatc	aa				622

<210> 313

<211> 674

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1) ... (674)

<223> n = A,T,C or G

<400> 313

nggacttgaa	atcattgaag	ttctgcaaaa	aggagatgga	natgcacaca	gaaagaaaga	60
tacagaggtc	cgcagacggg	agctcctaga	atccatttct	ccagctttgt	taanctacct	120
gcntgaacac	gccaagacg	tggtgctaga	taagtcagcg	tgtgngtagg	tntctgnct	180
tccngggaac	agacnaattn	gacctnagg	naacctgagc	ttnccaaagt	ncgcaagggt	240
gaagaagana	ggctnctcca	ggaagccnac	gagaaagana	aangagccgt	attttacncg	300
aacatgaaca	aatcaaaaaa	naaaactgtc	cgaaaaccgt	ttggagcaaa	ncaaaaaaaa	360
cagnacctgg	gngcccaaag	cattcnaana	tatttggtat	tancncaccn	tgatggattc	420
naaacnttat	tttttcttgg	cncggctggg	ccgcccggct	ngngnaaaga	aaagaacttt	480
nctaccnctc	ccgaatcaag	aaaagaanat	ggcttttttn	taaaanncaa	cccttgggaa	540
aaaattcttt	gtttaananc	cctccaange	ccgggaaatt	aattcatgct	ttgtgtgngc	600
gacnannaa	aaaanaanan	atccttctct	ccccttaann	gaaaagggcc	ttncaaaaaa	660
tgattgccca	agnc					674

<210> 314

<211> 646
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(646)
 <223> n = A,T,C or G

<400> 314

actttttttt	ttttttttt	ttttttttt	tttgagatgg	agtcttgctc	tgtcgcccag	60
gctggagtg	agtgttgca	tctcagctca	ttgcaacctc	tgccctcccag	gttcaagtga	120
ttctcctgcc	tnagcctcct	gagtagttgg	gactacaggc	acatgccacc	atgcctggct	180
aatttttttg	cattttttaag	tanagacagg	gtttcatcat	gttgggccagg	caggtntcaa	240
actcctgacc	tcaagtgatc	cacctgtctc	agcctcccaa	agtgctggga	ttacagggcat	300
gagccactgn	accggccta	aaaatgatta	cttcttataa	aaaggatttc	ttccccctca	360
caacacttan	cttccctttt	ctttcctggg	aactatgggt	ntggngnccg	cataaggatc	420
taccttnenc	aagctggaca	ntggggggtg	ctncttgang	gnaactcagg	ccanatacng	480
accctggggg	gaacnctaaa	cttacttggg	tanaaccggg	gctaacattt	ctgcttgnga	540
ngttgattcc	ccncaaattt	ttaaaagggn	tttcatggcc	cttagggcaa	ccattttaca	600
aagatgggnc	acatgggnctt	ggccgnaacc	cctangngaa	ttcncn		646

<210> 315
 <211> 666
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(666)
 <223> n = A,T,C or G

<400> 315

acagtctttg	gatatttagg	aaggggatgg	ggagaaagtc	agttctcaga	acaaattagt	60
cagcttcagt	ctcgtcagca	gggtcttttg	attctttgtt	cttccgcact	tcttcaatgt	120
gcttatecct	ctctcgcaaa	cggtccagtt	tggcagccat	ttgtgcctct	cggttctctt	180
tattagcttc	cattttgtgg	gtcagtttct	cttctgccat	tttactgaag	ttgntgttct	240
cttctattgc	cttctgaagc	acttctttct	cgtgtctctg	tttctcancc	agctgcttca	300
agaccttagc	ttcatgggac	ttgcgtcttt	cttctgcagc	ttctaatttc	ttctgaattt	360
cctccagga	aagaccttct	tctttggaag	ggaaaggggg	aattctggaa	ccagattctt	420
ttgacccaag	gctgaaaatc	agcttaaaag	cctggccttg	angcaccnt	tttcagntct	480
ttcacctgga	tatcntaaag	aagccctngt	gattnaaaac	aagccnaccg	gcantnnatt	540
ntgncaanan	cnnggataan	gnaatccctg	tnaantccna	cccctnacc	cattttcccg	600
ggaccttggc	ngnaaccctt	tanggngaag	tcnnccnctn	ggcggccgta	ctaangggac	660
ccaccg						666

<210> 316
 <211> 656
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature

<222> (1)...(656)
 <223> n = A,T,C or G

```

<400> 316
actcttggtt tgtcaatggg actttccagc aatccaccca agagctcttt atccccaaca      60
tcactgtgaa taatagtggg tcctatacgt gccaaagccca taactcagac actggcctca      120
ataggaccac agtcacgacg atcacagtct atgcagagcc acccaaacc ttcataccca      180
gcaacaactc caaccccgtg gaggatgagg atgctgtagc cttaacctgt gaacctgaga      240
ttcagaacac aacctactgt ggggtgggtaa ataatcagag ccttcccgcnc aagtcccagg      300
cttgacgttg gccnatgacc aacaggaccc tnactctact tagtgtcaca aggaatgatg      360
ganggaccct atgaagtgtg gaaaccagaa ccaattaagt ggtgnccaca cganccaggc      420
attcttgaat ggcccttatg gnccanaaga acccaccatt tcccctnata cacctaattc      480
cgtccagggt gaaccttaag ctntctggca tgcaancctt aaccactggc aggattcttg      540
gnttaatgaa gggaacattc nnaccncccc agaagttttt attttcaact tacttggaan      600
aacgggggct ntttactgcc ngccataact taacnggggc cnnanccggac ttcgnn      656

```

<210> 317
 <211> 636
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(636)
 <223> n = A,T,C or G

```

<400> 317
actttttttt tttttttttt tttttttttt tttgnagtca gctattttaat taggttctta      60
agacatttag aacaccaatt tgngaggata aattccattc gtcagagcaa acacagatcg      120
caggtagccc tggagctgag gaatagcttt gatttttggg aaaatttgtg agtccacagc      180
tttctgatca atcttgcgct gctccgtaat ctcatatttc cctttttctg ggnccgaaan      240
cttacctttc tggggnttgg gcttncgcag cttcttcttn ttgaagtaag catnagtaan      300
aagntttggg anttttacan tgntgatann cattttggnt gaagnggnan tgacnaattt      360
ctgggggggt cttcgtaaag gaactcnant gaggcccaag ggnccgtcen agtaataagg      420
ccctnncanc tgggttangga aaccccctnt tggcctgggg ggnccangag gntgatccaa      480
atggccccgg ggaaaagcng gntcaanttt tnacggctnc tnaaagggtt ttgccnggnt      540
taanttttnn ggnctttttc agnggaaana ccngctttgn nantntaccc ccggnctctc      600
ggcggaacc nttaggggna attncnct gggggg      636

```

<210> 318
 <211> 654
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(654)
 <223> n = A,T,C or G

```

<400> 318
cgaggtagcg ggggcctttc tgcccgtgga cgccgccgaa gaagcatcgt taaagtctct      60
cttcacctg cogtcatgtc taagtcagag tctcctaaag agccgaaca gctgaggaag      120
ctcttcattg gagggttgag ctttgaaaca actgatgaga gctgaggag ccatcttgag      180

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caatggggaa	cgctcacgga	ctgtgtggta	atgagagatc	caaacaccaa	gcgctncagg	240
ggctttgggt	ttgtcacata	tgccactgtg	gaagagggtg	atgcagctat	gaatgcaagg	300
ncacacaagg	tggatggaag	aattgtggaa	ccaaagaaaa	ctgtcttcag	agaagattct	360
taaagaccan	gtgcccactt	aactgtgaaa	aagatatttg	gtggtggcat	taaagaagac	420
actgaagaac	atcactaaga	gantattttg	aacagtatgg	anaaaattgn	agngattgaa	480
atnatgactg	ccnangcagt	ggcancaaan	ggggctttgg	ctttnnacct	ttgacnacca	540
tgactcnngg	ataaaatggg	attcnnaaat	ccctcntgng	aatggccnca	ctgggaagtt	600
ngaaancctn	ncaacnagaa	agggtncgnt	tnntccncca	aangcnaang	tttc	654

<210> 319

<211> 659

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(659)

<223> n = A,T,C or G

<400> 319

acgcggggaa	gccaactcag	actcagccaa	cagagattgt	tgatttgcct	cttaagcaag	60
agattcattg	cagctcagca	tggctcagac	cagctcatac	ttcatgctga	tctcctgcct	120
gatgtttctg	tctcagagcc	aaggccaaga	ggcccagaca	gagttgcccc	aggccccgat	180
cagctggcca	gaaggcacca	atgcctatcg	ctcctactgc	tactacttta	atgaaagacc	240
gtgagacctg	ggttgatgca	anatctctat	tgncagaaca	tgaattnngg	caacctgggtg	300
tctgtgctna	cccangccca	aggtgccctt	ggggcctcac	tgattaanga	aantggcact	360
gatgacttca	atggctggaa	tggccttcac	gaccccnaaa	aagaaccgcg	gnttgactg	420
gacagtgggt	ccctngntct	cttacaagtc	tggggcaatt	gganccccaa	nccatgntaa	480
ttcnggctac	tgggggtgagc	nnacctcagc	ccaggatttn	gaantggaan	gcctgncttg	540
ggaanacaag	ttcttctttn	gctngcaagt	tcaaaacctc	atgcagctgg	aaaatcatnt	600
ctanaactga	tcagcattcn	accgnttcaa	attaaccggc	ctttttcant	tanttaccg	659

<210> 320

<211> 664

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(664)

<223> n = A,T,C or G

<400> 320

ggtactctgc	cttttagggag	atgaggtaag	acatatacat	agatggcttt	tactagccaa	60
ggcaatgtaa	atggactaag	attctcatgt	gacttgaggt	tatctgatga	atattattctc	120
ttcaaaacca	cctactttta	gagggcatgt	ttaacccttc	tctttattta	aggagggaga	180
gaaaaacaca	tgtaaccaga	attcagagtg	ggttactcaa	cctaagagaa	catacgagtg	240
tctctttggg	aaaacgacaa	gactacagtg	ttcacttcgc	accatgaagt	ggcactcctg	300
ntatggctgc	agantcctct	tacttcttat	gaaaggatgc	atctgattct	gaaattactg	360
atatattcga	tcagttaggg	atgntttaaa	aagnghaaac	caatgccaca	catacacttt	420
ctagctttct	gaaaatnacc	cgacacattn	ccnaaaatng	agaatttacc	ctattacttt	480
tagagaaatt	tccataatat	tcttgggttaa	agaanccng	ttgggcatat	tnccaatttt	540
cagngnctn	ggttttatgc	ccnaganccc	aataggntcc	cccatTTTTT	aaggctTTTT	600

ccacngacga ttttttaaan cnttctnnan tgggggaaga ataatcttaa aagtngnctt 660
atnt 664

<210> 321
<211> 666
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(666)
<223> n = A,T,C or G

<400> 321
cgaggtacag tattacagtc agccacagaa gctgtgttgg gggacaagac ccaatccttc 60
ccccaccag gcaaagcagt attggacatg agttggcatg tggtggggcc cacgtcctta 120
tccccaggc ctgaggggag accaccttct gatgataacc aacccttagc taccactctg 180
tattcatcag gggaggggta taaacccgc atgcaagaag aacccttgcc ccagtgctca 240
aatgggatgg ggatgctaga gttatagtaa aggggaaacc ctatgtaagc tgntaacaga 300
gttcacaggg gtagggataa cccctgntct tcagctncca aatgngctca cttccagct 360
tcttcatccg tcatcaatgc tggcaaagtt tccctnaact gngggccagg tttcacgcat 420
gggtggctgc acctgggtca aaaaggtggn attggcctnt aaggaattag caatcatntg 480
ctgggtggga ttccagtgtg taaggaactt anccaactgc atggnntgnt tgtgcanctg 540
cttgatggng acaagttnt gcaccanctn aaggaaggtg gaagcatggg gctcaacctn 600
gataagttca tataacttggg gcnccttgct ttgggatctg catntttaca aggnntatcn 660
tggcan 666

<210> 322
<211> 631
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(631)
<223> n = A,T,C or G

<400> 322
accggaaagg aagctcccat tcaaaggaaa tttatcttaa gatactgtaa atgatactaa 60
tttttgtcc atttgaata tataagttgt gctataacaa atcatcctgt caagtgtaac 120
cactgtccac gtagttgaac ttctgggac aagaaagtct atttaaattg attcccatca 180
taactggtgg ggtacatcta actcaactgt gaaaagacac atcacacaat cacccttgctg 240
ctgattacac ggcttgggt ctctgccttc tcccttacc ctccgggtc cacccttct 300
gcaacaacag ccctntacct ggggggcttg ntagaagaga tgtgaagggt tcaaggctgc 360
aacctgtggg actactgcta ggtgtgtggg gnggttcgcc tgcacccctg ggttcttta 420
gncttaaagt gatgccctt tccaaccatt attctggncc cacacttctc actccggct 480
tggncnanca taaatgnacc ccttcacttc ctntgagaat ggccttcgng aagaatcnag 540
gctttcccaa ncttctttcc cccnttatc angggngctg gttttctnct ctcaaggctc 600
ntttgaccgn accacaaac ttctgaattn t 631

<210> 323
<211> 647
<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(647)

<223> n = A,T,C or G

<400> 323

actgtgggtc	gaagtaatgg	atacggacgt	aaccatcttc	gccgccgctg	ctgtagctct	60
tgccatcagg	atggaaggca	acactgttga	taggtccaaa	gtgacccttg	actcttccaa	120
actcttcttc	aaaggccaaa	tggaagaacc	tggcctcaaa	cttgccaatc	ctggtggagg	180
ttgtggttac	atccatggct	tcctgaccac	cgcccaggac	cacatgggtca	tagttggggg	240
agagggcagc	tgagttgaca	ggacgttctg	tccgaaaagt	cttctgatgt	tcaagagttg	300
tggagtcgaa	aagcttggct	gtgttgctct	tggacgcggt	cacaaacatg	ggcatgtccc	360
tggataactg	gatgtccgtg	atctgcccgg	agtgttctt	aacattncca	acacctnttc	420
aaanttggca	ctatactggg	tgagctcttc	acttttatng	gcaacgnatg	atcacttccc	480
caaggggtccc	caaacagcac	tggggaattt	agagncattc	caggggaactt	tatgtagggg	540
tcatgggtgca	attggttnga	tccccaggtc	aaaaagttnc	aaacactgga	nccctttctt	600
gtccnnnggag	aacatgttat	ttgccccaaag	taaaaccnng	nccggng		647

<210> 324

<211> 653

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(653)

<223> n = A,T,C or G

<400> 324

ggtacttttt	tttttttttt	tttttttttt	ttgagatgga	gtcttgcctc	gttgccagac	60
cggagtgcag	tgggtgcgatc	tgggtcact	gcaatctcca	cctcccgggt	tcaagcgatt	120
ctcctgcctc	agcctcccga	gtaactggga	ctacaggtgt	gcgccacca	gcccagctca	180
tttttgtatt	tttagtanag	atgggggttc	acgatgttgg	ctaggatggg	ctcgatctct	240
ggtcagagtc	ttttctgtaa	aaatccttgg	taaagaagca	attttagact	gtancctggt	300
gcaaatgcnt	taaggaagaa	gcaaaacaac	tgntagtctt	tctgaaatga	aaaaactacn	360
ccagggctgg	tatatnnaga	gcaaccccaa	ccannactnc	catcntgatg	cccacagggg	420
cccactgana	naccnngaaa	angtccnnaa	gcntaaannt	ngangcnttg	cttttgaaat	480
attgcgccng	taccnagntn	nagacaaacn	ngnttaaggc	ccnnantntt	tggccngant	540
ttgcgataaa	aaaaacttgg	gggtcgctnc	nngatccenn	ttgtncceca	naanctgggg	600
ggatgggttn	aagcccntgn	cnnaaggttt	nngttctccc	aaggtaaaaan	nng	653

<210> 325

<211> 655

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(655)

<223> n = A,T,C or G

```

<400> 325
ggtacgcggg gccttttggc tctctgacca gcaccatggc ggttggcaag aacaagcgcc      60
ttacgaaagg cggcaaaaag ggagccaaga agaaagtggg tgatccattt tctaagaaag      120
attggtatga tgtgaaagca cctgctatgt tcaatataag aaatattgga aagacgctcg      180
tcaccaggac ccaagggaacc aaaattgcat ctgatggctc caaggggtcg tgtgtttgaa      240
agtgagtctt gctgatttgc agaattgatga agttgcattt agaaaattca agctgattac      300
tgaagatgtt caagggtaaa aactgnctga ctaacttcca tggcatggat cttacccgtg      360
acaaaatgtg gtccatgggc aaaaaatggc agaccatgat tgaagcttac ggtgatgtca      420
agactaccga atgggtactt gcttcgtctg gtctgggggtg ggtttactaa aaaacgcaca      480
atnanatacc gaagaactct tatgcttang accacangtc cngccaatcc ggagaanata      540
tggaatctg accccaaagn gccnaccaat gacttgaaaa annggccatt aaatggttcn      600
nacacnttgg aaaagcctta aaagggttgc aantattaac cntcatgaa gnttc      655

```

```

<210> 326
<211> 657
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc_feature
<222> (1)...(657)
<223> n = A,T,C or G

```

```

<400> 326
ggtacgcggg ggaaacggga gtgaacggag agcgtagtga ccatcatgag cctcctcaac      60
aagcccaaga gtgagatgac cccagaggag ctgcagaagc gagaggagga ggaatttaac      120
accggtccac tctctgtgct cacacagtca gtcaagaaca atacccaagt gctcatcaac      180
tgccgcaaca ataagaaact cctgggccgc gtgaaggcct tcgataggca ctgcaacatg      240
gtgctggaga acgtgaagga gatgtggact gagggtacttt tttttttttt ttnttctttt      300
ttttgagata gggntcact gnatnacca ntntggaatg caattggcat gaacncagct      360
tactgnagnc ttccaaacct gggctcaagc aattatnttg nattaacctn ttgagtacct      420
gggactntcn cangcaccan ccctgctttg cttacttaaa tttttgtnaa nacnnggctt      480
gctttttttt ccaggntggn tcnaactecn gaattaagggt atccttcccc ctcaattttt      540
aaannngctg ngattntnga atangccttt ttgttngccc ttttnacctt ttnnnngggt      600
nnttcnnggc tttaancetn ccgggggccc tttaaaggng aaatcncncc ttggggg      657

```

```

<210> 327
<211> 658
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc_feature
<222> (1)...(658)
<223> n = A,T,C or G

```

```

<400> 327
ggtacttttt tttttttttt tttttttttt ttttttttgg tttgaaacag aaattttattc      60
tcanaataat gcacagaagc acagggttag gctactcttg ggaagcttec ctcccccttc      120
tcttctcct ctcctcctc tctgaatgcc agggagaaca cagttgaagg aaggaaacat      180
gcaatcacia acaatgaaca actntaaaga caaaaagggt tgggtccaaaa gaactcaaca      240
taattaatcc aatgactgtg aanagcttca ctgagtagga ttaanatatt gcagatgtan      300
ngtttncaaa ggggtggctnt tcagtgcacc ancggggcct ncttgangga natgaggact      360

```

```

gacncatncg ggaaanattt ttggcctgct tgctaaactt ggggntaaag gcacacnnnc 420
cggggccacc gttccactna nngcctgggg accanttgct aatgncnttt ccnaangntt 480
tttttgntgc cttgtgggtt nttdttgggtt ctggaactgn tcgncctgnc ttgnaaacca 540
ttntntnaac nccttaattg cctttctttt cnnnctgggt ntgnttccaa aatnggatta 600
nggggttcang ngcccctact tnccgggggc ngttaaangg naattccncc nctggngg 658

```

<210> 328
 <211> 644
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(644)
 <223> n = A,T,C or G

```

<400> 328
acgcggaacg tgggtttttg gcccgtttct gagcagcgct tcctttttgt cgcacatctt 60
gacgaggtcg cgggtgtctg tgctattctc cgagcttcgc aatgcccgtt aaggacgaca 120
agaagaagaa ggacgctgga aagtcggcca agaaagacaa agaccagtg aacaaatccg 180
ggggcaaggc caaaaagaag aagtgggtcca aaggcaaagt tcgggacaag ctcaataact 240
tagtcttgnt tgacaaagct acctatgata aactctgtaa ggaagtccc aactataaac 300
ttataacccc agctgtggnc tcttgagaga ctgaagattc naggtcncct ggccaggcca 360
gccccttagg agcttcttag taaaggactt atnaactggg tttnaancac agacctcaag 420
taattnacac cagaaatncc nnggtggaga atnctcncct gctggttnag angcatgaat 480
aggnncaacc agctntctct gncnnaccn cncttaggnc naattccgca cctgcgggcc 540
gttctnatgg atccnaactn ggtnccaant nggcnacta tggcatanen tgccctgggg 600
aantggttcc nttccaatcc anaanttcta tcgnaactta acgg 644

```

<210> 329
 <211> 651
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(651)
 <223> n = A,T,C or G

```

<400> 329
actattagcc atggtcaacc ccaccgtggt cttcgacatt gccgtcgacg gcgagccctt 60
gggcccgcgt tcctttgagc tgtttgagc caaggtccca aagacagcag aaaattttcg 120
tgctctgagc actggagaga aaggatttgg ttataagggt tcctgcttcc acagaattat 180
tccaggggtt atgtgtcagg gtggtgactt cacacgccat aatggcactg gtggcaagtc 240
catctatggg gagaaatttg aagatgagaa cttcctccta aagcatacgg gtcctggcat 300
cttgtccatg gcaaagtctg gacccaacac aaatggttcc cagtttttca tctgactgct 360
caagactgag tgggttgatg gcaagcatgt ggtgtttggc aaagtgaata gaaaggcat 420
gaatattgtg gaggccatgg aaccgctttg ggtccaggaa tgncnagaac agcaagaaga 480
acaccattgc tgactgngga caactcgaat aagttggact tgggggttant ttaaccacca 540
gaacaattcc tttgtncta aggagancan cctcaccaca tttgntngca tatcctanaa 600
actttgggct ttenttngtt cctttgggtc aggtttcctg gtcctccanc c 651

```

<210> 330

<211> 643
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(643)
 <223> n = A,T,C or G

<400> 330
 actttntttt tttntntttt tttttttttt ctggaaggnt ctcaggctctt tatttgctnt 60
 ctcaaattcc aggaatngac ttatttaatt aatccatcaa cctctcatag caaatatttg 120
 agaaaacaaa tttatattca gattcttatt ttcagtaggg aagtaagaag ttgcagctca 180
 ttgcacgtaa agttgagaca ganatggaga catccagccc cacctntctg gaacaagaaa 240
 gatgactggg gaggaacac aggtcancat gggaacaggg gttacagtgg acacaagggn 300
 gggctgnctn ttcacctnct tacattatgc taacagggac ncaaaccat tcaggggcct 360
 ttgcnaaaaag aaatgccaaa agctnttgaa gtncncaagg ggangcgtga anaaaactgc 420
 atttnagtc cccgggtcctt ngncgggaac cctnanggn gaaatcncca cactggcggg 480
 ccgtactagn ggatccagct nggncccaat tggnggaata tggnaaanac tggtcctgtg 540
 ggaaaatggg atccgtccaa ttcnccactt acanncgag cctaaangna aaacntgggg 600
 ngcctatggg gggctacnnn aataatgggt gcctacggcc cnt 643

<210> 331
 <211> 652
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(652)
 <223> n = A,T,C or G

<400> 331
 ggtacagatg gcactgacaa tcccctttct ggtggggatc agtatcagaa catcacagtg 60
 cacagacatc tgatgctacc agattttgat ttgctggagg acactgaaag caaatccaa 120
 ccaggttctc aacaggctga cttcctggat gcactaatcg tgagcatgga tgtgattcaa 180
 catgaaacaa taggaaagaa gtttgagaag aggcattatg aaatattcac tgacctcagc 240
 agcccgatc agcaaaaagc agctggatat tataattcat agcttgaaga aatgtgacat 300
 ctccctgcaa ttcttcttgc ctttctcact tggcaaggaa gaaggaagtg gggacagang 360
 agatggccct ttgcgttang tggccatggg ccttnccttt cactaaaagg aattaccgaa 420
 cagcnaaaaag aaagncttga gatagtgaat atggggatga tatctttaga agggngaaga 480
 tgggggtggat gaaattattc attcctgnga agnttgnaaa ctgngcgnct tcnnnaaant 540
 nnnaggcatt cntnnctgg cntgccatt gccattggnt ccanttgcta tagggatgcc 600
 ccttaaanen ntttcnna anagtnnaaa acttgcnnn ggatccaacc nn 652

<210> 332
 <211> 648
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(648)

<223> n = A,T,C or G

```

<400> 332
cgagggtactt tttttttttt tttttttttt tttttttgag acagagtttc actcttgctg      60
cccaggctgg agtgcagtgg cgcgatctcg gtccactgca acctcaccct cccaggatca      120
agcgattctc ctgcctcagc cacctgagta gctgggatta caggcgctcg ccactacacc      180
tagccaattt ttgtattttt agaagggaca gcatttcacc atgttgacca ggctggtctc      240
gaactcctga tctcaggnga tccaccacc tcagcctccc aaagtggngg gattacaggc      300
gtgagccact gaaagtcttc attagttttt tgggttaaatt ttaaacataa attatgttat      360
agcaaaaatt cctaagaatt gnaaaccact ttatcagaaa tatcnnaaat tcacaaataa      420
tnccaaaatt tataatagct tttttccaga ctaaaatttt aaagctactg anaagnggna      480
aacctncta nataggattt acctaacatt nnggantaaa aggnanccan ngcctgctaa      540
anatccagan tatctaanaa tccntnctcg nntctcnntc tatnttttca natccgaatt      600
tttgaacca cnttangata nctnntttcc cccttaacnn taattccc      648

```

<210> 333

<211> 656

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(656)

<223> n = A,T,C or G

```

<400> 333
cgagggtacaa gatgtccaaa tattgcgaag atctatattgg ggatctcctg ttgaaacaag      60
cacttgaatc acatccactt gaaccaggca gggctttgcc atcccccaat gacctcaaaa      120
gaaaaaatac cataaaaaac aagcggctga aacctgaagt tgaaaaaac agctggaagc      180
tttgagaagc atgatggaag ctggagaatc tgcctcccca gcaaaccatct tagaggacga      240
taatgaagag gagatcgaaa gtgctgacca agaggaggaa gctcaccccg aattcaaatt      300
tggaatgaa ctttctgctg atgacttggg tcacaaggaa gctgttgcaa atagcgtcaa      360
gaaggcttca gatgaccttg aacatgaaaa caacaaaaag ggcttggtca ctgtagaaga      420
tgagcangcg tggatggcat cttataaata tgtaggtgct ccactaatat ccatncatat      480
ttgtcaccat gatcaactac ccagnctgt naaggttcaa ggtttcatgt ggcanaagaa      540
cccatattc ttttacatgg cttctttaat gaatcatcgg cttgggtactg aaacctgcc      600
attgaattgc attntacaac ggcaatgagc natttcccca gggaggccng cnttct      656

```

<210> 334

<211> 647

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(647)

<223> n = A,T,C or G

```

<400> 334
acgcgggagg gaagtgcaga ggcaaatgca tttagtgttc ttcagcatgt cctcggtgct      60
gggccacatg tcaagagggg cagcaacacc gccagccatc tgcactaggc tggttgccaag      120
gcaactcagc agccatttga tgtttctgca tttaatgcc a gttactcaga ttctggactc      180
tttgggattt atactatctc ccaggccaca gctgctggag atgttatcaa ggctgcctat      240

```

```

aatcaagtaa aaacaatagc tcaaggaaac ctttccaaca cagatgtcaa gctgccaaaga 300
acaagctgaa agctggatac ctaatgtcaa tggagtcttc tgagtgnntc ctggaagaaa 360
gtcgggtccc aagctctaag tgctggntct tacatgccac cattcacaag tctttaacag 420
aatgattcan tggctaatagc tgatatcata aatgcgnaaa naaagtttgg ttctggcnag 480
aagtcaatgg cancaagtgg naaatttggg acatacnctt ttgtgataag tgggaatactg 540
gngcncnctt acngganana cttaacgttn tttaanccaa acacaaccct tgaaagnnna 600
agctctaaan accattggct tttttcnggg ngnaaaaaag gcttaag 647

```

```

<210> 335
<211> 657
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(657)
<223> n = A,T,C or G

```

```

<400> 335
acaggtcaga gtcttctttt cttttctttt tgagatggag tcttgctctg ttgccagact 60
ggagtgcagt ggtgcgatct gggctcactg caatctccac ctcccgggtt caagcgattc 120
tcttgcttca gctcccagag taactgggac tacaggtgcg cgccaccaag cccagctcat 180
ttttgtattt ttagtagaga tgggggttca cgatgttggc taggatggtc tcgatctctg 240
gtcagagtct tttctgtaaa tatccttggg aaagaagcaa ttttagactg tagctgttgc 300
aatgcttta aggaagaagc aaaacaactg tcaagtcttc ctgaaatgaa gaaactacac 360
cagggctgct atatcagagc aaccccaacc agcacttcaa tcatgatgcc nacagtggcc 420
cagctgagag accnggagaa agttccagat gcanagactg ngatgctctt gactatggaa 480
atattgcggc cagtaccaag ttagagacca aacaggcata ngnncccgtg ttaattggcg 540
tgaattttgc gataaganaa cttggggggg tgctgcggat nccatgactn ccagaaaact 600
tnngggatgg ggtanaggcc catggcagaa aggttanggt cttccaaaag naaaaaa 657

```

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<210> 336
<211> 649
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(649)
<223> n = A,T,C or G

```

```

<400> 336
ggtacgcggg caactatgga attccacagc gtgctctgcg gggtcactcc cactttgtta 60
gtgatgtggg tatctcctca gatggccagt ttgccctctc aggtccttgg gatggaaccc 120
tgcgcctctg ggatctcaca acgggcacca ccacgaggcg atttggtggc cataccaagg 180
atgtgctgag tgtggccttc tcctctgaca accggcagat tgtctctgga tctcgagata 240
aaaccatcaa gctatggaat accctgggtg tgtgcaaata cactgtcagg atgaaaacca 300
cttaaantgg gtgncttngg ncccttntng cccaacagca acaaccctat tatcgtcttc 360
tgnggctggg acaaaactggn taaaggatgg aacctggcta actgnaagct gaaaaacaac 420
cacattgggc acacangcta tntgaacacc gngactggct ttttcagang gatcctntgn 480
gcttntggag gcaaggatgg gcaagccatg ttatnngaac tcnaccaang caacaccttt 540
cacctttaan ggggggacat tatnaacgcc ttgggttaac cttaacgttn ttggtttngg 600
ctgcnaggcc ccacattaaa aatgggattt aanggaaana catttnann 649

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<210> 337
 <211> 652
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(652)
 <223> n = A,T,C or G

<400> 337
 actcttgggtt tgtcaatggg actttccagc aatccaccca agagctcttt atccccaaca 60
 tcactgtgaa taatagtgga tcctatacgt gccaaagcca taactcagac actggcctca 120
 ataggaccac agtcacgacg atcacagtct atgcagagcc acccaaacc ttcacacca 180
 gcaacaactc caaccccggt gaggatgagg atgctgtagc cttaacctgt gaacctgaga 240
 ttcagaacac aacctacctg tgggtgggtaa ataatacaaga gccttccggt cagtcccagg 300
 ctgcagctgt caatgacaca ggaccctnac tctactcagt gtcacaagga atgatgnaag 360
 gaccctatga atgtggaatc cagaacgaat taaagcggtg accacagcga ccangcatcc 420
 tgaatgcctt tttgggccan acgacccac cattttcccc tcataccact attaccgtcc 480
 aggggtgnac cttagncttt tcttgccatg cagcctttac ccaccttgac agnattcctg 540
 gctggatggt gggaacatna gnacncacnc aagagctntt tttccaaca tnatgggaaa 600
 acanngnnct tatactgcag gccattactt ngcctntgcc cagnnggctn cg 652

<210> 338
 <211> 651
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(651)
 <223> n = A,T,C or G

<400> 338
 ggtacatttg aacacacggc tgtgttaaag atgctgctaa tgtcagtcac tgggtgcact 60
 aaaggatctc ttatttttatg taaaacgttg ggattgacaa gatagatctg acactctgtt 120
 aagttaccct ctgaagctac ttcttgtgaa atactaatga cagcatcatc ctgccaaagcg 180
 aaagaggcag gcataagcaa ggacaaatta aaagggggta agagccttat catgatgagg 240
 agtcttgntt tgacatcttg ggaaaagctg ccatagtgtg aaagtcgtca atttctcacc 300
 atggtttgca gtttgactgn ctctagttag ggtgaagtct ctgagtggca cacaccttaa 360
 gcctgaagggn tttcccttta aattttcatt gagttggccc tcttcagcat atanggcttt 420
 aagaacagaa canaccttgg ttttaagtgg gtccatggga taaaatggga atggangact 480
 ngaagaattc aagggctggg ccatctngca gtattctgaa tatcgaaaat ncnccaaggc 540
 tgctatataa anccccctgg gcaanacttc aatcggaanc ccacggnggc ccnactnana 600
 gncaggaccn ttccaantgg aacatnggan tggggccttt gaggcnnngn n 651

<210> 339
 <211> 634
 <212> DNA
 <213> Homo sapiens

<220>

<221> misc_feature
 <222> (1)...(634)
 <223> n = A,T,C or G

<400> 339
 actttttttt tttttttttt ttttttctag tttcagttat ttattgattt aatcattgta 60
 atctccaata gagattacaa tagagatctc caacatgatt tcatgcattt agaggagaaa 120
 tatttcctgg ttaagtggaa aattgtgcgg atgtggcttc tggaanacct tcatttctaaa 180
 gcagcgttat agtgaaacat ttcatttana aatctggacg ttccttcttc agcttgctgt 240
 aatccacatt cactgagtag aacttgtatt gatcattggg acccagtttg ttccagggct 300
 ctgggttatt tctgcccac aaacatctgg attgaacaat gccagacgca agagatcagt 360
 gttgctccag tagctccagt tccaataaat acnaagaggg ggatcaaagc tcggatgctt 420
 cttggcctga ccgatgatct ggcgganccat gtttgcngca aagtctccga ctggaaagga 480
 ganaaccgcc taccccaagc cctaagctaa aaattatntg ccccgcgacc ttggncgnga 540
 ccnctaagg caattccacc actggcggcc gtctaangga tccacttggg ccaacttgng 600
 naacatggca nactggtcct ggggaangta tccc 634

<210> 340
 <211> 655
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(655)
 <223> n = A,T,C or G

<400> 340
 ggtactcttc cactcaggtat tccgtgcggc cactccagca caccaggtat gagcgcttca 60
 tcccctcggc ctaccctac tacgccagcg ccttctccat gatgctgggg ctcttcatct 120
 tcagcatcgt cttcttgac atgaaggaga aggagaagtc cgactgaggg gctagagccc 180
 tctccgcaca gcgtggagac ggggcagggg ggggggttat taggattggg ggttttggtt 240
 tgctttgttt aaagccgtgg gaaaatggca caactttacc tctgtgggag atgcaacact 300
 gagagccaag ggggtgggagt tgagataatt tttatataaa agaagtttt ccactttgaa 360
 ttgctaaaag tggnatTTTT cctatgtgca gtcactctc tcatttctaa aatagggacg 420
 tggccaggca ccgtggctca tgctgtaat ccacactttt ggaggnccng caagcggtta 480
 cgaagtcagg agatcgagac tattctggtt acacgnaaaa cctgncttac taaaagtacc 540
 tgcccggccg gccgntcaaa ggcgaatcca cacactggcg ggcgtactan tggatnccaa 600
 cttggaccaa cttggngnaa tatggcatat tggttcctgg nggaaatggt accnn 655

<210> 341
 <211> 648
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(648)
 <223> n = A,T,C or G

<400> 341
 acgaacctac agttttaact gtggatattg ttacgtagcc taaggctcct gttttgcaca 60
 gccaaattta aaactgttgg aatggatttt tctttaactg ccgtaattta actttctggg 120

ttgcctttgt	ttttggcgtg	gctgacttac	atcatgtgtt	ggggaagggc	ctgcccagtt	180
gcactcaggt	gacatcctcc	agatagtgtg	gctgaggagg	cacctacact	cacctgcact	240
aacagagtgg	ccgtcctaac	ctcgggcctg	ctgcgcagac	gtccatcacg	ttagctgtcc	300
cacatcacia	gactatgcca	ttggggtaag	ttgtgtttca	acggaaagtg	ctgtcttaaa	360
ctaaatgtgc	aatagaaggn	gatggtgcca	tcctaccgnc	ttttcctggg	tcctanctgn	420
gtgaatacct	gctacgtcaa	atgcntacca	ggttcattct	ncctttnact	aaaacacaca	480
gggtgcaacag	acttgaatgc	taagtatacc	taattggata	tgggatttaa	ttttctttct	540
tacaancatt	tgtattgcta	acaggccaaa	atttcagtta	cccttagggg	ggttaacaat	600
cnaattaaac	ctgggaggca	tacnttgnct	aaatattact	gnaaaaaa		648

<210> 342

<211> 342

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1) ... (342)

<223> n = A,T,C or G

<400> 342

gggtactttt	ttttttttt	ttttttttt	gtttttttt	ttttttttt	ttttttttt	60
tggctntana	gggggtanag	gggggtgctat	agggtaaata	cggggccctat	ttcaaanatt	120
tttaggggaa	ttaattctag	gacnatgggc	atgaaactgn	ggtttgctcc	acanatttca	180
nagcattgac	cgtagtatac	ccccggtcgt	gtancgggtga	aagtggtttg	gtttaaacgt	240
ccgggaattg	catctgtttt	taagcctaata	gtggggacag	ctnatgagtg	caaaacgtct	300
tgngatgtaa	ttattatacc	aatgggggct	ttaatcgggga	at		342

<210> 343

<211> 484

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1) ... (484)

<223> n = A,T,C or G

<400> 343

gggtacgatgc	ctagtgtatga	gtttgctaata	acaatgccag	tcaggccacc	tacgggtgaaa	60
agaaagatga	atcctagggc	tcagagcact	gcagcagatc	atttcatatt	gcttccgtgg	120
agtgtggcga	gtcagctaaa	tactttgacg	ccgggtgggga	tagcgatgat	tatggtagcg	180
gaggtgaaat	atgctcgtgt	gtctacgtct	attcctactg	taaatatatg	gtgtgctcac	240
acgataaaacc	ctaggaagcc	aattgatata	atagctcaga	ccatacctat	gtatccaaat	300
ggttcttttt	ttccggagta	gtaagttaca	atatgggaga	ttattccgaa	cctggtagga	360
taagaatata	aacttcaggg	tgaccgaaaa	atcagaatan	gtgttggtat	agaatggggg	420
cttcttcttc	ngcggggctn	aanaaggtgg	tggtncgcg	tcctggccng	gcnggcgctc	480
gaan						484

<210> 344

<211> 657

<212> DNA

<213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(657)
 <223> n = A,T,C or G

<400> 344
 cgaggtacgc gggattgttc tggggccttgt cctcctttct gttacggtec agggcaaggt 60
 ctttgaaagg tgtgagttgg ccagaactct gaaaagattg ggaatggatg gctacagggg 120
 aatcagccta gcaaactgga tgtgtttggc caaatgggag agtgggttaca acacacgagc 180
 tacaaactac aatgctggag acagaagcac tgattatggg atatttcaga tcaatagccg 240
 ctactgggtgt aatgatggca aaaccccagg agcagttaat gcctgtcatt tatcctgcag 300
 tgcttttgctg caagataaca tcgctgatgc tgtagcttgt gcaaaaaangg ttgtcccgtg 360
 atccacaagg cattaagagc atgggtggca tggagaaatc gttgtcaaaa cagagatgtc 420
 cgcagtatgt tcaanggtgt ggagtgtaac tncagaattt tccttcttca ctcatattggc 480
 tctctacatt aaggagtagg aaataantga aagggtcccct ccattaattt cccttcaaca 540
 aataattttt tccgaaacng gaccaaatat ggccttcttn tagannataa tgtcntaagg 600
 ggnattttatt ttaagcnnca canttttaat ttgcaaatna ctatctgggg aaaatac 657

<210> 345
 <211> 662
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(662)
 <223> n = A,T,C or G

<400> 345
 ggtacgcggg cgactcttag cgggtggatca ctgggctcgt gcgtcgatga agaacgcagc 60
 tagctgcgag aattaatgtg aattgcagga cacattgatc atcgacactt cgaacgcact 120
 tgcngccccc gggtcctccc ggggctacgc ctgtctgagc gtctcttgca aaaaaaaaat 180
 aaannanaaa acancaagta caatttaatg cntanaaagg cctctctcca taaaactcan 240
 cncttttacag atgtangaat atataagcnn tgccaaaatt actaatntgc cacatacnna 300
 gcatcaattc caggtgctag tnagngggaa aaaaanttgg agaattcggc cctcgangag 360
 ctccanant taanctnct tactaantnc canggttctt tcaagcatgg aaaaattaat 420
 ngtgctncat ngatnaangn cttgtcattg ggccttnttt cctngacctg gcccgccgn 480
 ccgttcnaaa ggctaaatcc agacactgcg gccgttntaa tggttcnnac ttggggccaag 540
 cttgggnaat catgggcaaa gctgttctctg ggnnaaatnt tatccnctcc aattcncaca 600
 natacgaanc tgaancttaa gtgtnanntn gggngctaaa agtggcnaaa ctcccttnat 660
 gg 662

<210> 346
 <211> 654
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(654)
 <223> n = A,T,C or G

<400> 346
 acttcttggc cgctcacta gcaactctccg cctgcttttt aaaggcttca ttggaggcca 60
 gcagcgtggc ctgctgcgaa atgagagtca ccaggcgtct aagcaggaag gacagcagcg 120
 aggaaaagcc agcaatgtag agattcctct gggcacggaa aagcttcatg tggaaagtgt 180
 ccatggcccc gggattgttc tggagggttca ccttttccgt cacatcatca tacttccgaa 240
 tttcgcgcac ggcatcgatg accaacagca caaggatgac aatgagaacc acaaagaagg 300
 tgttgccata ggacactaac aactccacca gccgggactt gaaaatcttc tgccatcttt 360
 taggagaaat gaagggaatg cagagaagca acacaacaaa gaccttcgca tagaggaagg 420
 tggcaactgc agtccactgc agactcatcc tgggtgctana agggttccac aggaagatgt 480
 gaacttgtnn cgagtttcca cagtcaacgt gtcccccgta ccttnggccg ngaacacnct 540
 taaggcgaat tccaccactg cnggccgtct antggatcca actnggncca acttggcgaa 600
 tatggcaaat tgttctnngg naaatggttc ngtcaattcc ccantacnac cgga 654

<210> 347
 <211> 536
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(536)
 <223> n = A,T,C or G

<400> 347
 ggtactaatt taaggtaaca attctcgagg taaaataagg cattatagta acacaatttt 60
 catgcctcag caattaacaa tgattttcgt ttaatttctt tccaactcta cagacataat 120
 tctgctttca ctttcatcac gctttcatat ggttttaaca ggggatacac ctctcttct 180
 aagaatctct gcacctgctg ggaggcacga ccagtgaag aagaaggatc cagtaaatga 240
 tccaactggg agtgaatggg actgaagtag gcatcaacct ggatacgctc tatgaggnca 300
 ttgcacccc ttctgctta accacagaag ctgcctgctg agaaagcact ctgattttct 360
 catggcaatc ttggcggcta ccttcacttt gaccatggcc atgatgatgg tctctgtggc 420
 catgaaangc agctcttgcc gaatgcgccg tcaattactt tgggggtacct gccnnggccg 480
 gccgntcnaa nggcgaattt cagccactgg cngncgtact agnggatcca actcgg 536

<210> 348
 <211> 665
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(665)
 <223> n = A,T,C or G

<400> 348
 ggtacgcggg ggtcggcgt aggccttagg tgggttcgtg cgccttctac ctgcgtgttt 60
 cggttttctt ggctcctcgg cccttttctc ccctgttgca gctgggagcg gacgaagcgc 120
 gaagctggga ttttttactg tctcctgaag aatttaacac aaacatggat atcagaccaa 180
 atcatacaat ttatatcaac aatatgaatg acaaaattaa aaaggaagaa ttgaagagat 240
 ccctatatgc cctgttttct cagtttggtc atgtggtgga cattgtggct ttaaagacca 300
 tgaagatgag ggggcaggcc tttgtcatat ttaagggaact gggctcatcc acaaatgcct 360
 tgagacagct accaggattt ccattttatg gtaaaccaat gccaatagac tatgcaaaaa 420
 cagattcgga tataatatca aaaatgcgtg gaacttttgc ttaaaaaaaaa aaannnnnna 480

```

naaaaaagtc ctgccnggcc gcccggttcaa anggcgaatt naccactggc ggccgttcta 540
gnggatccaa ctnggnacca acttggcgta atatggcaaa actggtncgc ngngaaatgg 600
tatccgttan aattcccaca cttcaaccgg aacctnaang taaacctggg gcctaagagn 660
gacnn 665

```

```

<210> 349
<211> 474
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc_feature
<222> (1)...(474)
<223> n = A,T,C or G

```

```

<400> 349
acttcgtcag tttgtaagac atgagtccga aacaactacc agtttggttc ttgaaagatc 60
cctgaatcgt gtgcacttac ttgggcgagt gggtcaggac cctgtcttga gacagggtga 120
aggaaaaaat ccagtcacaa tatcttctct agcaactaat gagatgtggc gatcaggggga 180
tagtgaagtt taccaactgg gtgatgtcag tcaaaagaca acatggcaca gaatatcagt 240
attccggcca ggcctnagag acgtggcata tcaatatgtg aaaaaggggt ctgaattta 300
tttggaaggg aaaatagact atggtgaata catggataaa aataatgtga ggcgacaagc 360
ncaaccatca tagcttgatn atattatatt tctgagtgcc agaccaaaga gaaggagtnt 420
aaanggatga tcntcttttg ggcattcatt tgggaccttn ggccgggaac accc 474

```

```

<210> 350
<211> 452
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc_feature
<222> (1)...(452)
<223> n = A,T,C or G

```

```

<400> 350
acgcggggac cgtggagagc agagcgcggc ggctggaagc tgctaagtca gagccgcgat 60
gttcgggatt gagggcctcg cgccgaagct ggacccggag gagatgaaac ggaagatgcg 120
cgaggatgtg atctcctcca tacggaactt tctcatctac gtggccctcc tgcgagtcac 180
tccatctatc ttaaagaaat tggacagcat atgaagacag gacatcacat atgaatgcac 240
gatatgaaga gcctgggttac agtttcgact cctctctgca agtgaatagg cccagaaagg 300
tgtaagagac tctttgaatg gacataaaat tctgcttggt aagaacaagt ttggctctgg 360
taactgacct tcaaagctaa aatataaaac tatttgggaa agtatgaaac gatgtcttcg 420
tgatctgggtg taccttggn cngaccacgc tt 452

```

```

<210> 351
<211> 616
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc_feature
<222> (1)...(616)

```


<223> n = A,T,C or G

<400> 351

ggtacgcggg	aataattcca	tagtcaagag	catcacagtc	tctgcatctg	gaacttctcc	60
tggtctctca	gctggggcca	ctgtcggcat	catgattgga	gtgctgggtg	gggttgetct	120
gatatagcag	ccctgggtgta	gtttcttcat	ttcaggaaga	ctgacagttg	ttttgcttct	180
tccttaaagc	atttgcaaca	gctacagtct	aaaattgctt	ctttaccaag	gatatttaca	240
gaaaagactc	tgaccagaga	tcgagaccat	cctagccaac	atcgtgaaac	cccatctcta	300
ctaaaaatac	aaaaatgagc	tgggcttggt	ggcgcgcacc	tgtagtccca	gttactnggg	360
aggctgaggg	aggagaatng	cttgaacccg	gnagggtggag	attgcagtga	gccagatcgn	420
acnactgnac	tcagctggc	aantgagnag	gcttccatct	nanaangaan	aganangang	480
actntnacct	ggacctgccn	ggccggtcgt	ttgngcaggt	cnggagattt	attcccttng	540
ggtggggngc	nntaattggn	tgntgggccc	attcangttt	tgggaatttc	nncttggnnn	600
naaaanggga	aatttt					616

<210> 352

<211> 603

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(603)

<223> n = A,T,C or G

<400> 352

ggtacggcac	ttggcgtaaa	gccgcttccc	tcaagagtaa	ctacaatctt	cccatgcaca	60
agatgattaa	tacagatctt	agcagaatct	tgaaaagccc	agagatccaa	agagcccttc	120
gagcaccacg	caagaagatc	catcgcagag	tcctaaagaa	gaacccactg	aaaaacttga	180
gaatcatggt	gaagctaaac	ccatatgcaa	agaccatgcy	ccggaacacc	attcttcgcc	240
aggccaggaa	tcacaagctc	cgggtggata	aggcagctgc	tcagcagcgy	gcactacaag	300
ccaaatcaga	tgagaaggcg	gcggttgag	gcaagaagcc	tgtggtaggt	aagaaaggaa	360
agaaggctgc	tggttggtgt	aagaagcaga	agaagcctct	ggtgggaaaa	aaggcagcag	420
ctaccaagaa	aaccagcccc	tgaaaagaac	ctgcagagaa	gaaacctact	acngaggaga	480
agaagcctgc	tgcataactc	ttaaatttga	atatttcntt	aagggcnaat	nttttggcag	540
gttcttttga	taagacntnt	tttcngngtg	ggaaaataan	tnnnntattn	nnngctntcc	600
tgg						603

<210> 353

<211> 604

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(604)

<223> n = A,T,C or G

<400> 353

ggtaccgact	gtttttgaca	actatgcagt	cacagttatg	attgggtggag	aaccatatac	60
tcttggaact	tttgatactg	cagggcaaga	ggattatgac	agattacgac	cgctgagtta	120
tccacaaaca	gatgtatttc	tagtctgttt	ttcagtggtc	tctccatctt	catttgaaaa	180
cgtgaaagaa	aagtgggtgc	ctgagataac	tcaccactgt	ccaaagactc	ctttcttgct	240

```

tggtgggact caaattgatc tcagagatga cccctctact attgagaaac ttgccaaagaa 300
caaacagaag cctatcactc cagagactgc tgaaaagctg gcccgtagacc tgaaggctgt 360
caagtatgtg gagtgttctg cacttacaca gaaaggccta aagaatgtat ttgacgaagc 420
aatattggct gccctggacc tncagaccga agaagacccc aagtgtgtgc tgctatgaac 480
atctttcaga gcctttcttg nacagctgga ttggcatctt cttaaagcca tgnttaaatt 540
caacttanga ttaaaattaa aattcgtttt gcannatggc caatgcctgg actaaccan 600
ggcn 604

```

```

<210> 354
<211> 631
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc_feature
<222> (1)...(631)
<223> n = A,T,C or G

```

```

<400> 354
ggtacttttt tttttttttt tttttttttt ttggggacgg agtcatgctc tgcgcccag 60
gctggagtgct agtggcatga tctcggtcca ctgcaagctc cgcctcccgg gctcatgcc 120
ttctcctgcc tcagcctccc gagtagctga gattataggc acctaccacc acgcccggct 180
aatTTTTtga ttttttagtag agacgggggtt tcaccatgtt gaccaggctg gtctcgaact 240
cctgacctta ggtgatccac tcgccttcat ctcccaaagt gctgggatta caggcgtgag 300
ccaccgtgcc tggccacgcc caactaattt ttgnattttt agtaagagac agggtttcac 360
catgtttggcc aaggctgctc tttgaactcc tgacctcatg taatcgacct gcctttggcc 420
ttccaaaagt gctgggatta ccagggtgtga gcccacaagc cccggnacct ggccnggcng 480
gccgtttaaa agggcgaaat cagcacaatg gnnggccgta ctaaggggat ncnanccttg 540
nanccaactt tgggggaaat atggggcana actggttcct ngngnaaatg gtaaccgtta 600
caaattcccn caaanttttg nnccggggagg n 631

```

```

<210> 355
<211> 626
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc_feature
<222> (1)...(626)
<223> n = A,T,C or G

```

```

<400> 355
ggtacgatgc ctagtatga gtttgctaata acaatgccag tcaggccacc tacggtgaaa 60
agaaagatga atcctagggc tcagagcact gcagcagatc atttcatatt gcttccgtgg 120
agtgtggcga gtcagctaaa tactttgacg ccggtgggga tagcgatgat tatggtagcg 180
gaggtgaaat atgctcgtgt gtctacgtct attcctactg taaatatatg gtgtgctcac 240
acgataaacc ctagggaagcc aattgatatc atagctcaga ccatacctat gtatccaaat 300
ggttcttttt ttccggagta gtaagttaca atatgggaga ttattccgaa gcctggtagg 360
ataagaatat aaacttcagg gtgaccngaa aaatcagaat aggtgttttg tttagaatgg 420
ngtcttctnc ttcnngctgg gttnaagaan gtnggggttc nngcgtncn gntcgggcgg 480
ntggttttta nggccnaaat tcnngnataa ttggggcng ttactaagng gnatctanct 540
tggtncctaa nttggngnta atcatggtnc tagctngtnc tcnngtntaa attggnntcc 600
tgttaaattn tntnnaatnt tntggc 626

```

<210> 356
 <211> 617
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(617)
 <223> n = A,T,C or G

<400> 356
 actttttttt tttttttttt ttttttttcta gtttcagtta tttattgatt taatcattgt 60
 aatctccaat agagattaca atagagatct ccaacatgat ttcattgcatt tagaggagaa 120
 atatttcctg gttaagtgga aaattgtgcg gatgtggctt ctggaanacc ttcatttctaa 180
 agcagcgta tagtgaaaca tttcatttan aaatctggac gttccttctt cagcttgctg 240
 taatccacat tcaactgagta naacttgat tgatcattgg gacccagttt gttccagggc 300
 tctgggttat ttctgtccca acaaacatct ggattgaaca atgccagacg caagagatac 360
 agtgttgctc cagtagctcc agttccaata aatacnaaga ggggggatcaa gctcggatgc 420
 ttcttggcct gaccgatgat ctggccggaa ncatgtttgc cggcaaaaagg ctccnacttg 480
 ggaaagggga naaccgcct aaccnccagg gcctaagctt aaaatttttg gccccgggta 540
 ccttggccgg gaccccttaa gggngnaatt ccnnccctt ggggggcccgt ttaangggan 600
 ccaacttgnn ccaaatt 617

<210> 357
 <211> 611
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(611)
 <223> n = A,T,C or G

<400> 357
 ggtacttttt tttttttttt tttttttttt ttttaggcaa agaactttat taatctttgt 60
 ttcaaacttg attcccaggc ttcttcggct taattagctg caaagaatga attgngtata 120
 agcaaaaact gaaaagagct gcagtgtcca aggggcttgg gcttaaaaat attagagatc 180
 tagattttat cagatccata aacaaaaatt tcttaaaaag cagtcataat ataaaatagc 240
 agctcccagt aacttcttca ggnnttatct tcagaagttg actcaattca gtttgctca 300
 ttcttggaag cctcatcaaa attctccaca agatctggaa cttcatcatc atcatcctct 360
 ccagtaacaa gtggngcttt tccatcccca gantggttgg gcanaacttt ngncagctc 420
 cttaacttag cagactattc ggacccaagc tnggttnaaa aanctgggaa cnatttntgn 480
 naactggttt ggttnaacan ggcntgnaag ggggaaagg gnccctgcc caaaaaaccn 540
 ggaccttag ggtgnnaaag gggacctggc cctgggttgg aaccaantcn ccttttnana 600
 ccnnanaatn g 611

<210> 358
 <211> 619
 <212> DNA
 <213> Homo sapiens

<220>

<221> misc_feature
 <222> (1)...(619)
 <223> n = A,T,C or G

<400> 358
 ggtactttttt tttttttttt tttttttttt ttgagatgga gtctcgcctct gtcgcccagg 60
 ctggagtgca gtggcgcaat ctctgctcac tgcaacctcc gcctcctggg ttcaagcaat 120
 tctcctgtct cagcctccca aatagctggg attacgggca tgtgtcacga cgctcggcta 180
 atttttgtat ttttagtcga gacgagggtc caccatgttg gctaggctgg tctcaaactc 240
 ctgacctcag gtgatccgcc tgctcggcc tcccaaagtg ttaggattac ggggtgtgagc 300
 cactgcgccc agcaagcaac ctagatttta aaacaacatg agataaataa gcctaattgg 360
 atttaactac atctaacatt tttactaata gttgnaatac tggtagaatt tggaaactat 420
 tatatatatt atgcngaaaa gtaaataatt ctggtaaaat canttanggn ccntgaattt 480
 nagcataggg gaaaaaaaaga tgccntttta aatccaataa gtaaaaaaccn tttaacccctn 540
 tnttttaatt ggaanttccc cccaatttnt tattaatttc aacttntttt gaaaactcat 600
 ntttccnaaa antnggggg 619

<210> 359
 <211> 624
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(624)
 <223> n = A,T,C or G

<400> 359
 ggactttttt tttttttttt tttttttttt ttttttggag gaaaacccgg taatgatgtc 60
 ggggttgagg gataggagga gaatggggga taggtgtatg aacatgaggg tgctttctcg 120
 tgtgaatgag ggttttatgt tgtaaatgtg gtgggtgagt gagccccatt gtgttggtgt 180
 aaatatgtag agggagtata gggctgtgac tagtatgttg agtcctgtaa gtagganagt 240
 gatatttgat caggagaacg tggttactag cacagagagt tctcccagta ggtaaatagt 300
 ggggggtaag gcgaggttag cgaggcttgt tanaagtcac caaaaagcta ttagtgggag 360
 tagagtttga agtccttgag agaggattat gatgccactg ngaatgcntt cctaatttga 420
 gtttgctagg cagaatagtn atgaggatgt aaacccttng gccaatattt aaaaatgact 480
 gcncccgta aacttnaggg ggtttggatt aaaaangctt gtacttccaa nggctntntg 540
 gcctnattta aaaaatttcc ctnnncnaat ttagggcttn ttnnncnaag ccnanagggn 600
 ccccnancct ttcccggggg ggc 624

<210> 360
 <211> 611
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(611)
 <223> n = A,T,C or G

<400> 360
 acgcgggggag gcggaggctt ggggtgcgttc aagattcaac ttcacccgta acccaccgcc 60
 atggccgagg aaggcattgc tgctggagggt gtaatggacg ttaatactgc tttacaagag 120

```

gtttctgaaga ctgtcctcat ccacgatggc ctagcacgtg gaattcgga agctgccaaa 180
gccttagaca agcgccaagc ccattcttgt gtgcttgcat ccaactgtga tgagcctatg 240
tatgtcaagt tgggtggaggc cctttgtgct gaacaccaa tcaacctaat taaggttgat 300
gacaacaaga aactaggaga atgggtaggc ctttgtaaaa ttgacagaga ggggaaaccc 360
cgtaaagtgg ttggttgagc ttgtgtagta attaanact atggcaagga gtctcagcca 420
aggatgtcat tgaagagtat ttcaaagcc agaaatgaag aaattaaatc nttggcttac 480
ttaaaaaaaaa annnnnnnnnn aaaaaaaagg tccttgggagc gnacaccctt aaggggnaat 540
tcnnnnccct gggggccntt ataangggnn ccnacttggg ccaaattggg naaananggg 600
naaanttttt n 611

```

```

<210> 361
<211> 404
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc_feature
<222> (1)...(404)
<223> n = A,T,C or G

```

```

<400> 361
acatatttta atagaaagat acaacctttt tatttttact ccttttattt ctgctgcttg 60
gcacattttt gagttttccc acattatttg tctccatgat accactcaag cagtgtgctg 120
gacctaaaat actgacttta gttagtatcc ttggattttt agattcccag tgtctaattc 180
cctgttataa ttgctgcaaa caaaacaaaa tggtatgata atctttctcc actgttctaa 240
tatatattgt atttttattt gatagcttgg gatttaaaac atctctgttg aaggcttttg 300
atccttttga gaaataaaga tctgaaagaa atggcataat cttaaaactt gataaaaaaa 360
aaanannnnn nnnnaaaaaa aaagtacctn ggccgngacc acgc 404

```

```

<210> 362
<211> 322
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc_feature
<222> (1)...(322)
<223> n = A,T,C or G

```

```

<400> 362
ggtagctttt tttttttttt tttttttttt ttttttggag ttgtaggcaa atgtttaatt 60
aattctgctc atatgcacat ctgaaagcat gagacacact ccacagacag cagcactgg 120
ggctggtggg gcanatgggc actcgccgat taggtattaa tgtcaataat acgtgcataa 180
agtgtgata aaataactta agtggtacaa aaagagacag tccacggtgg ctgcaggcac 240
atgcaggcgg gactgggtca gacactccag ggctgcacat gttccagctg gcctgagtcc 300
gacacgtcat agctggcctt gt 322

```

```

<210> 363
<211> 616
<212> DNA
<213> Homo sapiens

```

```

<220>

```

<221> misc_feature
 <222> (1)...(616)
 <223> n = A,T,C or G

<400> 363
 cgaggtagcg gggctaagca agggaaaaat aacagtttct ctgagccaga gaagacttga 60
 tcacagttct ccaagcatcg tgatagcaat gcttaacccc aggaagattt caaggcaggg 120
 agaagaacat ttcaaataag attcttggtta acccatttat gcctagtgtt ccattattgg 180
 aatgctaagc ttgtgggagt catttacatc ctactgetca aagtcattgc caaggtctga 240
 tttttcacac aaaaaattgc aacccccagc ataaatgttt agctactgtc atcagtttagc 300
 aaattcatcc acacaaacac aattagagtt tgggtttttt ttaagctttt caaaacttac 360
 taaactggca caattttata tgtatgctat ttggtgnatt tatgcttaag agcnaaaaag 420
 tttgatggga ttttaaattc angccaagcc tacacgctga gacaatccct acaaccatgg 480
 nagtaactaa ngaaccttta tctaagnttt taagttttta anggagngct taatggttca 540
 ngctctangtt ggaatttctt tcanaaattt cntcttttaa aaaattttcc caaaatnggt 600
 ccttaaaaaa ctcann 616

<210> 364
 <211> 618
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(618)
 <223> n = A,T,C or G

<400> 364
 cgaggtagcg ggggcttctc gcctaacgcc gccaacatgg tgttcaggcg cttcgtggag 60
 gttggccggg tggcctatgt ctcccttgga cctcatgccg gaaaattggg cgcgattgta 120
 gatggtattg atcagaacag ggctttgggt gatggacctt acactcaagt gaggagacag 180
 gccatgcctt tcaaatagcat gcagctcact gatttcaccc tcaagtttcc gcacagtggc 240
 caccagaagt atgtccgaca agcctggcag aaggcagaca tcaatacaaa atgggcagcc 300
 acacgatggg ccaagaagat tgaagccaga gaaaggaaag ccaagatgac agattttgat 360
 cgtttttaaag ttatgaaggc aaagaaaaatg aggaacagaa taatcaagaa tgaaagttaa 420
 agaaaacttca aaaggcagct nttctgaaaag cttnttccca aaaaagcacc tgggtacctg 480
 gccgggcccgg ccgttttaaaa gggcnaattc caccactggc ggccgtctan ngggatccaa 540
 cttnggacca acttggngga atatggcnaa attgttctcg gggnaaatgt ttncgttcaa 600
 attnncnaaa ttacggcc 616

<210> 365
 <211> 601
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(601)
 <223> n = A,T,C or G

<400> 365
 acgtcctgga ggactctatt gtggacccac agaatcagac catgactacc ttcacctgga 60
 acatcaacca cgcccggctg atgggtgggtg aggaacgatg tgtttactgt gtgaactctg 120

acaacagtgg	ctggactgaa	atccgcgagg	aagcctgggt	ctcctctagc	ttatttgggtg	180
tctccagagc	tgtccaggaa	tttgggtcttg	cccgggttcaa	aagcaacgtg	accaagacta	240
tgaagggttt	tgaatatatc	ttggctaagc	tgcaaggcga	ggcccccttcc	aaaacacttg	300
ttgagacagc	caagggaagcc	aaggagaagg	caaaggagac	ggcactggca	gctacagaga	360
agccaaggac	ctcgccagca	aggcgggccac	caagaacagc	agcagcagca	acagtttgtg	420
taaccagnct	accaacaaca	nagnacccca	nacaggtagg	cttaccctt	tggcctcctt	480
taatggacct	tggcgggaa	cacccttang	gcgaattcag	ncactggggg	ccgtactang	540
ggatccnctt	ggaccaactt	ggggaaacag	ggcaaaattg	ttcttgggga	aattntatcc	600
n						601

<210> 366

<211> 321

<212> DNA

<213> Homo sapiens

<400> 366

actttttttt	ttttttttt	tttttttgag	atggagtctc	actctgtcgc	ccaggctgga	60
atgcagtgg	gcaatctcag	ctcactgcaa	cttccacctc	ccagggttcaa	gtgattctcc	120
tgccctcagcc	tcccacatat	ctgggactac	aggtgcacac	caccatgccc	agctaatttc	180
tttgtatttt	ttagtagaga	cggggtttca	tcttattggg	caggctgggc	tcgaactcct	240
aaccttgtga	tctgccacc	tcggccttcc	aaagtgtctg	gattacaggc	gtgagccacc	300
gtgctcggcc	acccgcgtac	c				321

<210> 367

<211> 264

<212> DNA

<213> Homo sapiens

<400> 367

actgatcatg	gagttaatca	acaatgtcgc	caaagcccat	ggtaggttact	ctgtgtttgc	60
tggtgttggt	gagaggaccc	gtgaaggcaa	tgatttatac	catgaaatga	ttgaatctgg	120
tgttatcaac	ttaaaagatg	ccacctctaa	ggtagcgctg	gtatatgggc	aaatgaatga	180
accacctggg	gctcgtgccc	gggtagctct	gactgggctg	actgtggctg	aatacttcag	240
agaccaagaa	ggtcaagatg	tacc				264

<210> 368

<211> 488

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1) ... (488)

<223> n = A, T, C or G

<400> 368

ggtacagatg	cacaggaggc	catagggttt	aggcanaggg	gagcacaan	gttgaagatg	60
aggcgctgcc	atcaatgctg	ggacttcagg	cnaagggcag	gaactgagga	agccacaagg	120
gaggacattt	tctgcagttg	ctgaancagt	ancaactagg	tcctgagaaa	gccctntctc	180
gtggaagaat	aacagccagg	cnggaaagct	tttcatcctg	caaagctggg	gaagaagatt	240
cttccttaaa	ttgtcatctg	cacttcagct	cangaatcct	gttggctgaa	gtccagagtg	300
tccttttctg	attcctgaag	tanatnaaca	gcccnngccc	aangaagagn	aggnttagta	360
caaagccnnc	tncgcgtacc	tgtncgggag	gnngttcgna	aggntcaaat	tccagcacia	420

ttgnctgccg ttantagttg gattctnact ttngtactta ncttggcgta ntttatggtn 480
ataanttg 488

<210> 369
<211> 602
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(602)
<223> n = A,T,C or G

<400> 369
acggggggttt cactacttct cccccggact ccttggtagt ctgttagtgg gagatccttg 60
ttgccgtccc ttgcctctct tcaccgccgc agacccttc aagttctagt catgcgtgag 120
tgcattctcca tccacgttgg ccaggctggg gtccagattg gcaatgcctg ctgggagctc 180
tactgcctgg aacacggcat ccagcccgat ggccagatgc caagtgacaa gaccattggg 240
ggaggagatg attccttcaa cacttcttc agtgaaacgg gtgctggcaa gcatgtgccc 300
cgggcagtgt ttgtagactt ggaaccacac gtcattgatg aagttcgac tggcacttac 360
cggcagctct tcaccctgag caactcatca caggcnagga aaaatgctgc aataactatc 420
ccgaaggcac tacaccattg gcaaggagaa taattgacct gtgttgacc gaattcgcaa 480
gctggctgac catgcaccgg ctttaagggtt nttggttttc ccaacttttg gggggggaac 540
tggttttngg gtaaccctnn tggtnatngg aacgnnttta antggatttt gggaanaaan 600
cc 602

<210> 370
<211> 257
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(257)
<223> n = A,T,C or G

<400> 370
actttttttt tttttttttt ttttagttttt ttttattttt tacaaatata ctggagaatc 60
atgcaatgct gccagcattg gatgcaatcc ggggccacaa gtctgcacac tcctttgcta 120
ctggtcctgt aatggcagaa cctttcatct cgcctttatt gntcactatg actcctgcat 180
tatcttcaaa ataaagaaac acgccatctt ttctacggta tgactttcgt tgtcgaatga 240
ccactgctgg atgtacc 257

<210> 371
<211> 607
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(607)
<223> n = A,T,C or G


```

<400> 371
actttttttt tttttttttt tttttttgct atttagtttt tatttcataa tcataaactt      60
aactctgcaa tccagctagg catgggaggg aacaaggaaa acatggaacc caaagggaac      120
tgcagcgaga gcacaaagat tctaggatac tgcgagcaaa tggggtggag ggggtgctctc      180
ctgagctaca gaagggaatga tctggtggtt aagataaaaac acaagtcaaa cttattcgag      240
ttgtccacag tcagcaatgg tgatcttctt gctggtcttg ccattcctgg acccaaagcg      300
ctccatggcc tccacaatat tcatgccttc tttcactttg ccaaacacca catgcttgcc      360
atccaaccac tcagtcttgg caagtgcaga tgaaaaactg ggaaccantt ggggttgggg      420
ccacatttgc catggacaag aatgccagga acccgatatg ttttaaggatg aagtctcatc      480
ttcaaaattc ttccccataa atggacttgc caccagngcc attatggcgt gtgaagtccc      540
cancctggcc cataaaccct ggaaaaatnt tggnaaaccg gaaccctttt aaccaatcct      600
ttttttc

```

```

<210> 372
<211> 607
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc_feature
<222> (1)...(607)
<223> n = A,T,C or G

```

```

<400> 372
acgaatgtgg gaattactca ggagcagcag aatatcttta tttttttaga gtgctgggttc      60
cagcaacaga tagaaatgct ttaagttcac tctggggaaa gctggcctct gaaatcttaa      120
tgcagaattg ggatgcagcc atggaagacc ttacacggtt aaaagagacc atagataata      180
attctgtgag ttctccactt cagtctcttc agcagagaac atggctcatt cactggctc      240
tgtttgtttt cttcaatcac cccaaaggtc gcgataatat tattgacctc ttcctttatc      300
agccacaata tcttaatgca attcagacaa tgtgtccaca cattcttcgc tatttgacta      360
cagcagtcac aacaaacaag gatgttcgaa aacgtcggca ggttctaaaa agatctaggt      420
taaagggttat tcaacangga gtcttacnca tntaagaccc cattacngga atttggtgaa      480
tggttatatg taactttgac ttttaangggc tcaaaaaaag ct naggggat gtgaatcaag      540
cttgngaagg ctttttttgg gggctngntt nngggttnt tgnaaagncc ngtttntnt      600
ttggaat

```

```

<210> 373
<211> 618
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc_feature
<222> (1)...(618)
<223> n = A,T,C or G

```

```

<400> 373
acttttaatg ttgctgttc aaacgaaaat agattggatc ttggttaagt tcacttggtt      60
tggccaggca cagtggctca cgctgcagt cccagcactt ggggaggtgg aggcgggccc      120
atcacctgag gtcaagagtt tgagaccagc ctggctaacg cggtgaaacc ccatttctac      180
taaaaatata aaaaattagc tgggcgtggg ggtgcgcgct tgtaatccca gctactcggg      240
aggctgaggc aggagaatcg cttgagccag agaggcaaag gttgcaataa gccaatagatg      300
cgccattgta ttccagcttg gacaacaaga gcgaaactct gtctaaaaaa aaaaaaaaaa      360

```

cacacacaca	acacaatatt	ttcacgcctg	taaacctagc	acattgggaa	gccaaggtgg	420
gaggattgct	tgaggccagg	agttcaaggc	ttgcantgag	ctatgaatgn	acactgnacc	480
tttgngcng	aacacnctta	nggccaaatt	cngcacact	tgggggccgg	tactaanggg	540
atcccanctt	tggnnccaaa	nttgngnaa	acatgggcaa	aattggtncc	tgngaaaaat	600
ggttccgctt	caaatccc					618

<210> 374
 <211> 605
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1) ... (605)
 <223> n = A,T,C or G

<400> 374						
acccagctgc	tgcccacatt	tctgggtccag	agtcccgaac	cccagacact	gggatgcctg	60
gctactccga	gcgttatcca	gactagcgag	tgggaggcag	atgtaaaatc	tggaacgcag	120
atthttagttt	gttggaagga	gaatatgtaac	atagtgaacc	acgcatctct	ggaggggtgta	180
aagcagagac	agccaagagc	caaggcactg	atgtttgaac	tggaacttc	aaaacgttta	240
ataagagtct	tcaggatggg	tttgaactag	acaagctaga	aatttcttta	gaacaccagc	300
tctagcatgc	atctcccact	tttggctttc	ctggagagga	gcttgaagag	gtggttctgc	360
agacagccac	agtgatactc	aggaaacnca	gaggaatgga	tttgactttt	ctgctaggaa	420
tctttgggtat	aagtctctct	tgagttgtaa	gangcatgga	aatatacatg	aaactgaana	480
acctgcaagg	aanggaaatg	ggaacntttc	atctgagtg	aaactaacca	agtnnggcaat	540
ttngacttga	aacccttgaa	accttcnagt	ccaantcctg	gtttggggga	taaangaacc	600
ggnen						605

<210> 375
 <211> 602
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1) ... (602)
 <223> n = A,T,C or G

<400> 375						
acggatgcta	cttgtccaat	gatggtaaaa	gggtagctta	ctggttgtcc	tccgattcag	60
gttagaatga	ggaggtctgc	ggctaggagt	caataaagt	attggcttag	tgggcgaaat	120
attatgcttt	gttggttgga	tatatggagg	atggggatta	ttgctaggat	gaggatggat	180
agtaataggg	caaggacgcc	tcctagcttg	ttagggacgg	atcggagaat	tgtgtaggcg	240
aataggaaat	atcattcggg	cttgatgtgg	ggaggggtgt	ttaaggggtt	ggctagggta	300
taattgtctg	ggtcgcctag	gaggtctgg	gagaatagt	ttaatgtcat	taaggagaga	360
atgaanagaa	gtaagccgag	ggcgtctttg	attgtgtagt	aaggggtgga	ggtgatttta	420
tcggaatggg	aagtgattnc	taagggngtg	tttgancccc	gtttgtgcca	gaatangaag	480
tggaatgctt	cttanggctt	caataaatga	anggcanaat	gaattgaaag	gtaanaaac	540
cntnaagggg	ggacttggtta	ctgataaccn	tcctaaaatc	attgccccgn	aacttggccg	600
gg						602

<210> 376

<211> 611
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(611)
 <223> n = A,T,C or G

<400> 376
 acgcgggatc gaagaattca caaaaaaaca tagcctcatc atccccacca tcatagccac 60
 catcacccctc cttaacctct acttctacct acgcctaate tactccacct caatcacact 120
 actccccata tctaacaacg taaaaataaa atgacagttt gaacatacaa aaccaccccc 180
 attcctcccc acactcatcg cccttaccac gctactccta cctatctccc cttttatact 240
 aataatctta taaaaaaaaa aaaaaaaaaa aaaaaaaaaa ncaaaaaaaaaa aaaaanaaaa 300
 aaaaaaaang tncngccatt tttngtttcn ggtaaacnng aatataangn gaaagaacaa 360
 acnttggaac atacttaatg gattttttata gaactttgna aaccaaagga gattcatgtt 420
 ttanaagtct ggcctttttt atatcttgga agaaaattat gtntggaggc tntaaataaa 480
 tccattatt ttctcaggga atctgggtag gaattgccgg catgggaant tttnggggc 540
 cggatnggaa agtttggcct aanaaatngc nctttntnaa naattttgga attttgggaa 600
 gccnaagca n 611

<210> 377
 <211> 367
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(367)
 <223> n = A,T,C or G

<400> 377
 acgcggggcgg tttggcatct ctgcctcat cgtgggtttc gactttgatg tcactcctag 60
 gctctatcag actgacctc cgggcacata ccatgcctgg aaggccaatg ccataggccg 120
 ggggtgccaag tcagtgcgtg agttcctgga gaagaactat actgacgaag ccattgaaac 180
 agatgatctg accattaagc tggatgatcaa ggcactcctg gaagtgggtc agtcagggtg 240
 caaaaacatt gaacttgctg tcatgaggcg agatcaatcc ctcaagattt taaatcctga 300
 agaaattgag aagtatgttg caaaaaaaaaa aananaaatn aaanaagtac ctcgccgng 360
 accacgc 367

<210> 378
 <211> 611
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(611)
 <223> n = A,T,C or G

<400> 378
 ggtacctgga tctgtctect ctgggttgaa acccgggcgc cgccaagatg cgggttacc 60

```

actcttctct catggatcct gataccaaac tcacgggaaa catggcactg ttgcctatca 120
gaagtcaatt caaaggacct gccccagag agacaaaaga tacagatatt gtggatgaag 180
ccatctatta cttcaaggcc aatgtcttct tcaaaaacta tgaaattaag aatgaagctg 240
ataggacctt gatatatata actctctaca tttctgaatg tctgaagaaa ctgcaaaagt 300
gcaattccaa aagccaaggt gagaaagaaa tgtatacgct gggaaatcact aattttccat 360
tcctggagag cctgggttttc cacttaacgc aatttatgcc aaacctgcaa acaaacaggg 420
aagatgaagt gatgagagcc tatttacaac agcttaaggg caagaaactg gactggaact 480
ttgtgaagaa gttttcgacc cttagaatgg ttaaaccnac agtgggggga cttgcttttg 540
gaaaanaccg ttattgacn anagtttttt tggactggan atgaaaggng cccnggttng 600
ccccggtttn n 611

```

```

<210> 379
<211> 602
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc_feature
<222> (1)...(602)
<223> n = A,T,C or G

```

```

<400> 379
acagctgggt ggacctattc atgcatcttc accagcagct ggagcatctc caccettgggt 60
atctctgggt taaattactt gagctctgtg ctttgaacc agtttgataa gtcctttact 120
aaggagctcc tgaagggctg ccctggccag ggagcctcga atcttcagtc tctcagagac 180
cacagctggg gttataagtt tatagttggg aacttcctta cagagtttat cataggtagc 240
tttgtcaaac aagactaagt tattgagctt gtcccgaact ttgcctttgg accacttctt 300
ctttttggcc ttgccccggg atttggtcac tgggtctttg nctttcttgg ccgactttcc 360
agcgtccttc ttcttcttgt cgtccttagg cggcattgcc aagctcggag aatagcanca 420
gacacngnaa cctngtcaag atgtcngaca aaaagccccg ggtaccttgg gcgngaacac 480
gcttaaggcg aattccacac actggcgggc gtactanggg gatccagctt nggaccaact 540
tggnggaaac atggcnaact gnttcctnng ggaaaatgtn atccgttaaa attnccccaa 600
at 602

```

```

<210> 380
<211> 598
<212> DNA
<213> Homo sapiens

```

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<220>
<221> misc_feature
<222> (1)...(598)
<223> n = A,T,C or G

```

```

<400> 380
ggtacngcgg ggggtgcctg gctccgtttc ctgcttttgg ttcttacagt agtcggcgta 60
ggccttagat tttttactgt ctctgaaga atttaacaca aacatggata tcagacccaaa 120
tcatacaatt tatatcaaca atatgaatga caaaattaaa aaggaagaat tgaagagatc 180
cctatatgcc ctgttttctc agtttgggtca tgtgggtggac attgtggctt taaagaccat 240
gaagatgagg gggcaggcct ttgtcatatt taaggaactg ggctcatcca caaatgcctt 300
gagacagcta caaggatttc cattttatgg taaaccaatg cgaatcagta tgcaaaacag 360
attccggata taatatcaaa aatgcgtgga acttttggg ccaagaaaag aanaaagaaa 420
agaaaaagnc caaacttggg aacaactgna caaccncaac caaaaanctg ggcnnngggac 480

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tccaaatcac	ttatacccag	ggaattcacc	ccnaatctta	ggtcctgata	ctttcaacta	540
tatttaatcc	ttaaaactta	nccgaagagc	taatngatga	tgtntcctgc	cggtaacn	598

<210> 381
 <211> 631
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(631)
 <223> n = A,T,C or G

<400> 381						
ggtacgcggg	gagagtgtgg	tcaggcggct	cggactgagc	aggactttcc	ttatcccagt	60
tgattgtgca	gaatacactg	cctgtcgcct	gtcttctatt	caccatggct	tcttctgata	120
tccaggtgaa	agaactggag	aagcgtgcct	caggccaggc	ttttgagctg	attctcagcc	180
ctcgggtcaaa	agaatctgtt	ccagaattcc	ccctttcccc	tccaaagaag	aaggatcttt	240
ccctggagga	aattcagaag	aaattagaag	ctgcagaaga	aagacgcaag	tcccatgaag	300
ctgaggtctt	gaagcagctg	gctgagaaac	gagagcacga	gaaagaagtg	ctttagaagg	360
caatagaaga	agaaccacaa	cttcgtaaaa	atggcnga	aagaaaetga	ccnccaaaat	420
gggagcttat	taaagagaan	ccagangnnc	caatngnttg	gccaaactggg	accgtttgca	480
anaagaaggg	ttagccccnt	tgaanaaatg	ccggaagaac	caaagaattc	caagaccctt	540
gntgcnaaac	ttgaacttgc	ctaattggct	ttgagaactg	cttttttccc	atcccttcta	600
aatccaaaa	atgnacctgc	ccggggggccg	t			631

<210> 382
 <211> 613
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(613)
 <223> n = A,T,C or G

<400> 382						
acattcccag	atTTTTaagc	ctccctcata	aacacctgta	atcagatcag	agtgagaaga	60
aaagcttttt	gaaactatgt	tttctccagg	gaagttctct	ttcaacaaga	tggttttcac	120
tactgataac	ttaacatgct	ggaaacctgg	taatgtttct	atgactttat	tttctaacat	180
cttctttaaa	tcttttaggca	tagcatgctc	tttggcagct	ctcaaggagg	gctgtttcca	240
tgtggctcca	agttccttga	actgctggct	gcactgagtg	gactgtctgt	gtcttgagag	300
ggagctgcat	tttcattgac	ttatggtccc	acaagtgacc	ctgaggcaan	gtcnaattgg	360
tctncanaac	atTTTTggcc	ctctcttctc	ctttttgact	tttctgagac	tgacagttct	420
tttganggaa	tccaggggna	angcttccnt	ctctaattggg	ggntaaattc	atTTTccaaa	480
anggnccggt	tttgggaaaa	tnaaanttga	aanggcaccc	nttttattaa	tgcccnanc	540
ttttaanttc	ngattntnaa	cttntctgnta	gaatttgtgg	atccnccaaa	ttggcttaat	600
attcaaatag	ctt					613

<210> 383
 <211> 628
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(628)
 <223> n = A,T,C or G

<400> 383
 ggtactttga ccctggaaag gtatgggtct gcttaaaaga aagaagaaac atacacgtaa 60
 tcaaataaag cttaacatta tgcagggctt ataatcattt tcagcaacgg actgcaagct 120
 gcactgtgaa gaaaatgcat agcagaggag aaagctgggg atctgaggaa ataggtaagg 180
 aaaacagtgt caacacacag tggagaagat gatgaagaca tctattccgg agctcacgtg 240
 ccatgccctg ctagecgttcc ttaacaagcc acctgctcca gaaggccaca gcctgaccct 300
 cccaagtgga atataaatgc ccaagtgccat catgaagcca ccttctncac tacctaaaaa 360
 ggttggtctgg gactgagctc agaacacaca cctttctggg ctaccaaacc tttaagtgga 420
 aagaattttt tnctaaatat ctanttttna taccacactt aacgccactt ttatattgaa 480
 attgggcttc taattagncc ctctcctcaa ttccttagga nggaactcat aatgggagcc 540
 aaccaaccag ggattctacc cccaatngac tgnnctttaa angattattt aattttgang 600
 ggcaaagggtg tgaatggttt acaatacc 628

<210> 384
 <211> 620
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(620)
 <223> n = A,T,C or G

<400> 384
 acaggtaagc cctgggtgcc tccaccact cccagggaga ccaaaagcct tcatacatct 60
 caagttgggg gacaaaaaaa gggggaaggg ggggcacgaa ggctcatcat tcaaaataaa 120
 acaaaataaa aaagtattaa agcgaagatt aaaaaaattt tgcattacat aatttacacg 180
 aaagcaatgc tatcacctnc cctgtgtgga ctggggagag gactgggcca ttctccttag 240
 agagaagtgg gngggctttt angatggcaa gggacttcct gtaacaatgc atctcatatt 300
 ttggaatgac tattaaaaaa acaacaatgt gcaatcnaaa gtctcggcc atttgcggaa 360
 ctttgggggg atgcttgctt cnaccgantt ggtgncaacc tttnnccggt tccanttttt 420
 naaattctta gttnnaagcnn aaaaanntag aatancncna nancataact tannaancca 480
 tttaanaggt ccctcggccg gaacnnnctt aanggttaat cccantnnnt ggcgggcggt 540
 actncnggat ccanccttgg nnccaaantn gnggaattca tggcnaaacc gntcctgggn 600
 gaantngttn ccttnaaanc 620

<210> 385
 <211> 535
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(535)
 <223> n = A,T,C or G

<400> 385

ggtacttttt	tttttttttt	tttttttggg	atthtagtttt	tattttcataa	tcataaactt	60
aactctgcaa	tccagctagg	catgggaggg	aacaaggaaa	acatggaacc	caaagggaac	120
tgcagcgaga	gcacaaagat	tctaggatac	tgcgagcaaa	tgggggtggag	gggtgctctc	180
ctgagctaca	gaaggaatga	tctgggtgggt	aagataaaaac	acaagtcaaa	cttattcgag	240
ttgtccacag	tcagcaatgg	tgatcttctt	gctgggtcttg	ccattcctgg	acccaaagcg	300
ctccatggcc	tcacaatatt	catgccttct	ttcactttgc	caaacaccac	atgcttgcca	360
tccaaccact	cagtcttggc	agtgcagatg	aaaaactggg	aancntttgg	ggtngggncn	420
acatttgctt	tggccaaaat	gccnggaacc	ggccccgtac	cttgncnngg	ccggccggtt	480
caaaagggcg	aattccacac	acttggcggg	ccgtactang	gggatccaac	ttcgg	535

<210> 386

<211> 642

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(642)

<223> n = A,T,C or G

<400> 386

acagcattgg	cagtgggtgcg	tcagaggtgg	cagaactatt	tcacactaac	cagttgaaga	60
ctacacaaga	ttaataccat	ccagcatcag	gatatactg	tggattttac	aaaccattct	120
tattttctaac	ttcaggagtt	gatgtttttc	ccagtccttc	ttaaaatatt	actgctttta	180
tcacagatca	ggtaaaaagg	acaacatgca	caacctccac	ctagaatcct	ggtgtagcct	240
agacagtga	atgatatgac	atcagaagac	tttaaaattg	cagctccttt	tggatcccc	300
aaagtgtatc	tgcactcttc	ttcaaacggg	ccctcttttc	tcaagaagtc	agaagtcacc	360
ttcacaangn	ctgagaattc	cattctgnnc	ccaaantgca	agggacactn	aaggaagaca	420
tcattctttt	attccgtnaa	agacccttaa	ttcatggng	gaaactgggt	gcacccgcct	480
nagaatcttt	attanactct	ttgnccaatt	tggttacaga	agagntncan	tanccccang	540
aannggtagc	ctttggagtt	tgantcacc	tcataagcac	ccttaaacca	cctgnttggg	600
gaaccttctt	tcactggtcc	ctaactttat	tangccctaa	ag		642

<210> 387

<211> 256

<212> DNA

<213> Homo sapiens

<400> 387

ggaccttttt	tttttttttt	tttttttttt	tgaaaagaaa	ggcctttacat	atthtattact	60
gaatccagcc	aaccaacgtg	ttcataacag	attcagagag	gaaaacacgt	cgaaatctcc	120
agatagtggg	gacattttca	gcttgatatg	gtaacatgat	cgtgaccttc	agacagcata	180
aatatgtgtg	ccatctcatg	tgcaattcct	tatagaccca	gcttggttct	tctccaatgt	240
ctccttttgg	agttgt					256

<210> 388

<211> 566

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(566)

<223> n = A,T,C or G

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<400> 388
ncnagcggcc gccngncng gnactgaaca ttggtaaaaa attatatgag ggtaaaacaa      60
aagaagtcta cgaattgtta gacagtccag gaaaagtcct cctgcagncc aaggaccaga      120
ttacagcagg aaatgcagct agaaaaaac cacctggaag gaaaagctgc natctcaa      180
aaaatcacca gttgtatttt tcagttatta caggaagcan gtattaaac tgccttcacc      240
agaaaatgtg gggagacagc tttcattgca ccgcagtgtg aaatgattcc aattgaatgg      300
gtttgcacaa gaatagcnac tggttctttt ctnaaaagaa atcctggngt caaggaagga      360
tataagtntt accccctaaa gtggagntgt ttttcaagga tgatgcccac taatgaccnc      420
cagtcgggct tgaagaacna cttgattgct gcaaaaattt gcttttcttg gacttcttat      480
anggcnaacc tgaaanggat ttcatgaagt catgctacnc aggctatatt tgaaatctgg      540
gagaaatcct ggttgcccaa aattgg                                     566

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<210> 389

<211> 629

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(629)

<223> n = A,T,C or G

```

<400> 389
actttttttt tttttttttt ttttttggtt tttttttttt tttttttttt ttttttttgc      60
agtttctaag tcattacttt tnattttgaa agatttgnga aactnttcac atcatggtga      120
gagtttgat gattaataan aagcagcttt ttcatgaaat gcttgagggt gaacgagttt      180
tcagcctgng anatccgacc ntcccattaa ctttgaagtt tctcttgatt aatagaagaa      240
aaaaggggag ggtgaanaaa aggaggaaca tgctaaaaac cttatgacaa tcatccaaat      300
gtgaggaaaag aacaaccgga ttcaccaact ccactttttc tattttacaa ctttctacat      360
ctcacncttg gattttggcc ttcttggttn aaacantcct ggcantcct tanagcccct      420
gaaaaagagc cntggntttt ncaaaagacn ntnggnnggn gaannccttn annatgccct      480
gaccntttn cnaagaactn nntntccggg ntcccaaaag tttgaccan cagcttantg      540
tgaannnaaa actnncttn aaaggtaatg gngggaannng gtgannaant gggttttttt      600
ganaagtctt ntttttctna aaaccnccg                                     629

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<210> 390

<211> 596

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(596)

<223> n = A,T,C or G

```

<400> 390
actttaattt atttccctt tctagtgtat taagaaatga catgcacttt aatttgccaa      60
aagcaatgct tgtattctgg cagcaacatg ctacttctat cacatagtaa agtgaatacc      120
agaactacaa aggcaggagg tgtaagtga tttttattgg gaggggagggt tggcaactta      180
aacagcagca aataaagagt gaataaggaa actccctgtt gccacagata cacaagacct      240
ccgtatgtga tacaggagcc atttcaattt gtgacccta gacagagatg gcaagtgcct      300

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ttccattcaa	tctaatactt	ccggattcct	actaaaaagg	aatcattaag	agcatggaaa	360
agttgcttac	tggaaggaa	acccccgaag	agtaaggga	gggaatgtga	aattaagaag	420
ttatgtggaa	tctcttaaat	tgnaattact	acatttctta	atttccaggt	atnccaaaca	480
cagtcnnttg	caaaactggg	cagntactta	aatnccngat	ccatttttagg	cnttacataa	540
gtggttgga	gtacctatgg	tatttnaatg	aactttttaa	ctttntccg	ccgtcc	596

<210> 391

<211> 625

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(625)

<223> n = A,T,C or G

<400> 391

acacacccag	gaaatttgct	atccaccctg	agagtaacaa	ccttattatc	attgaaacgg	60
accacaatgc	ctacactgag	gccacgaaa	ctcagagaaa	gcagcagatg	gcagaggaaa	120
tggtggaaagc	agcaggggag	gatgagcggg	agctggccgc	agagatggca	gcagcattcc	180
tcaatgaaaa	cctccctgaa	tccatctttg	gagctcccaa	ggctggcaat	gggcagtggg	240
cctctgtgat	ccgagtgatg	aatcccattc	aagggaacac	actggacctt	gtccagctgg	300
aacanaatga	ggcagnttta	gtgtggctgt	gtgcaagggt	tccacactgg	tgaagactgg	360
tntgtgctgg	tggtgtngn	canaggacct	ngntnctaaa	accnccgnnt	tgggcaatgg	420
ggctttcgtc	taattnttac	aannttgntg	accaatnggg	gatnaactgg	annttttgn	480
tcaanactnt	tttggaataa	tntccctnnt	gcnattngcc	ntatttctctg	gggaanggtg	540
ttnatatngt	natggnaaaa	cntntanccg	nnntntaatc	ttggaatata	tatnaatacc	600
ttcttaaaan	ntgntnatta	tcctt				625

<210> 392

<211> 266

<212> DNA

<213> Homo sapiens

<400> 392

ggtacccata	ttgctaatagc	taggatcaag	ataccacata	gccagaacaa	gaagttgaag	60
gtaaacatag	aatattttat	acaggcactc	acacctgcca	tttcggaaaa	ggattaggaa	120
tccagatgcc	gtgaatttaa	ctattcggtta	caggettgct	ctgcaatatg	ctctggagca	180
acttgctgc	agagatttct	gtatccacgg	cttcagagca	gaaagagaaa	gcaaagaagt	240
agaggaggga	ataaaaatcc	ccgcgt				266

<210> 393

<211> 611

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(611)

<223> n = A,T,C or G

<400> 393

ggtacttttt	tttttttttt	tttttttttt	tggttttacc	tgtttttatt	ccttaaaaga	60
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aaaaaacaac tttaatgcat acatacagaa tagaatacac ttacttaagt tttgacagtg 120
aaaaaaaata attacagggtt agatatatta tccaagggtt aacatgggga tgatctcata 180
aggcaatttc tttccttttaa taaatattaa agtgaatatt attctggaag caaatcatct 240
cctaattctt catcagcaaa atcatcctca tcgacccctt tcttggtctgc agtttttggg 300
cgttctattt gagggccaag tgggtccaca taggaggcat ctatttcttt gntactgcta 360
ctttcataag gntcatttgt cccaggtaaa agctctgagt ctggccttan tccgtcacc 420
tttactactg gcncatatagt ctggccacta tnaacgntag ccttncctnt cnttttgnca 480
cnggagcccc caatgcannt ttngcntgac tttagcncng gncctaatt cttcattttt 540
ccacctttta gnttttggca antcttgagc cntttttaat cnaagacttn gcanagccaa 600
ttaaaaaccc c 611

```

<210> 394

<211> 340

<212> DNA

<213> Homo sapiens

<400> 394

```

acgagtccca ctatgcgctg cccctgggccc gcaagaaggg agccaagctg actcctgagg 60
aagaagagat tttaaacaaa aaacgatcta aaaaaattca gaagaaatat gatgaaagga 120
aaaagaatgc caaaatcagc agtctcctgg aggagcagtt ccagcagggc aagcttcttg 180
cgtgcatcgc ttcaaggccg ggacagtgtg gccgagcaga tggctatgtg ctagagggca 240
aagagttgga gttctatctt aggaaaatca aggcccgcaa aggcaaataa atccttggtt 300
tgtcttcacg caaaaaaaaa aaaaaaaaaa aaaaagtacc 340

```

<210> 395

<211> 557

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1) ... (557)

<223> n = A,T,C or G

<400> 395

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acacatcttc aaagcacttc cctttaacgg gaaacttagc tttatgggat ttaaacatta 60
gaaagtggga aaaaaaattc cattttcttg tcattataaa ccaaaacaaa atctagtgt 120
agtcaaggaa actcattcac acttcaggtc cttctcctcc aggaaccagc attgttatat 180
tatctccatt tagcaaaatc tgatgtaatt tagtaatcct tcttccttct ggtgtgattt 240
caaactcagt gacatcttcc agtactttnt tttttttttt ttttttttgg gtgttgagct 300
tggacgcttt cttaattggg ggctgctttt aggcctacta tgggtgttaa atttttactc 360
tctctacaag gntttttcct agtggccaaa agaagctggt cctctttttg gactaccgtt 420
aaaattacca nggggattta aaangggntn tgngggccaa attnaaagtt ngactangan 480
tctatttttg gcccaaccagt nttaaccagg cttegggtang gttggccgcc cccgggtacc 540
ttgggcccgg aacacnc 557

```

<210> 396

<211> 617

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(617)

<223> n = A,T,C or G

<400> 396

ggtacngcgg	ggccactcga	gtgcgcaggc	gcctggcgat	taccggtctc	accatggagc	60
ggaaagtgct	tgcgctccag	gcccgaaga	aaaggaccaa	ggccaagaag	gacaaagccc	120
aaaggaaatc	tgaaactcag	caccgaggct	ctgctcccca	ctctgagagt	gatctaccag	180
agcaggaaga	ggagattctg	ggatctgatg	atgatgagca	agaagatcct	aatgattatt	240
gtaaaggagg	ttatcatctt	gtgaaaattg	gagatctatt	caatgggaga	taccatgtga	300
tccgaaagt	aggctgggga	cacttttcaa	cagtatgggt	atcatgggat	attcagggga	360
agaaatttgt	ggcaatgaaa	gtagttaaaa	gtgctgaaca	ttacacttga	aaccagccta	420
gatgaaatcc	ggttgcttga	agtcagttcc	aattcagacc	ttatggatcc	aaatngaaaa	480
atggttgtgc	actactagat	gactttaaaa	ttcaggaggt	aatggaacac	atatttgcac	540
gggatttgaa	gttttggggc	anattngtta	agnggttctc	aaatcaattn	ttangggctt	600
tcctgccttg	ggtnaaa					617

<210> 397

<211> 594

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(594)

<223> n = A,T,C or G

<400> 397

acgcggggga	tcaggactcc	tcagttcacc	ttctcacaat	gaggctccct	gctcagctcc	60
tggggctgct	aatgctctgg	gtcccagggt	ccagtgggga	ccgtcgtggt	gactcagctc	120
ccggtctccc	tgcccgtcac	ccttgacag	ccggcctcca	tctcctgcag	gtctggtgaa	180
actctccttt	acgaagatgg	aagcacctac	ttgagttggt	ttcaccagag	gccaggccaa	240
tctccgaggc	gcctgattta	taaagtthct	aaccgggact	ctgggggtccc	agacagattc	300
agcggcagtg	ggtcaggcac	ttatttcacg	ctgaaaatca	acagggtaga	ggctgatgat	360
gttgggaatt	attactgcat	gccanggtca	aactggcccc	tcacttttctg	gngaaggacn	420
aaaggtggcc	natcaaacca	actgnggctt	gaccattggc	ttcatnttcc	cgccatttga	480
taaccantga	aatctggact	gctttgtggg	ngcctgctga	aaacttntat	nccnanaggc	540
cnaagtcatg	acagtttttc	natttactcg	aaaaatntgg	aatgataat	tttn	594

<210> 398

<211> 611

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(611)

<223> n = A,T,C or G

<400> 398

acagtggctc	ttttcagagt	tggacttcta	gactcacctg	ttctcaactc	ctgttttaaat	60
tcaaccagc	catgcaatgc	caaataatag	aattgctccc	taccagctga	acagggagga	120
gtctgtgcag	tttctgacac	ttgttgttga	acatggctaa	atacaatggg	tatcgctgag	180
actaagttgt	agaaattaac	aaatgtgctg	cttggttaaa	atggctacac	tcactctgact	240

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cattctttat tctattttag ttggtttgta tcttgccctaa ggtgcgtagt ccaactcttg 300
gtattaccct cctaatagtc atactagtag tcatactccc tgggtgtagtg tattctctaa 360
aagcttttaa tgtctgcatg cagccagcat tcaatagtga atggnctctc tttggctgga 420
attaccaaac tcagagaaat gnggcacatg gagaacatct taaccccatg aanggataaa 480
agccccaat gngnggnact tgataatagc nctaattgct taaanatttg gtccactttt 540
tacctaaggt gagcccattg aaccannngt gctaaaangct catacttcca actgaaatgg 600
ttaaggaaaa a 611

```

```

<210> 399
<211> 614
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc_feature
<222> (1)...(614)
<223> n = A,T,C or G

```

```

<400> 399
actctgtgaa tgggtgagagg ctgggcacct acatgggcca taccggagct gtgtgggtgtg 60
tggacgctga ctgggacacc aagcatgtcc tcaactggctc agctgacaac agctgtcgctc 120
tctgggactg tgaacagga aagcagctgg cccttctcaa gaccaattcg gctgtccgga 180
cctgcggttt tgactttggg ggcaacatca tcatgttctc cacggacaag canatgggct 240
accagtgtct tgtgagcttt ttgacctgc gggatccgag ccagattgac aacaatgagc 300
cctacatgaa gatcccttgc aatgactcta aaatcaccag tgctgtttgg ggacccctng 360
gggagtgcac catnctggcc atgaaaagtg gagagctnaa ccagtattag tgcnnagt 420
tnnanaaggt gttngttnaa tgtaaagga gcantttccg gnagaataac cnacnttcag 480
gttattccnn gganatgacc anngtttnga ccccttnnna gtccattaat nccnaacttt 540
tttacnctca aattttnaan tnanaaaact tttngnatna aattnttnaa ttanttgttc 600
tttttcaata tnnn 614

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<210> 400
<211> 612
<212> DNA
<213> Homo sapiens

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<220>
<221> misc_feature
<222> (1)...(612)
<223> n = A,T,C or G

```

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<400> 400
acttacactg tgaaatttta tgatggagta gttcagactg tcaaacatat tcatgtcaaa 60
gctttttcca aagatcaggc ctaaagaaac agatcaciaa agtctttcat catctcctga 120
taaacgagag aagtttaaag aacagagaaa agcaacagtg aatgtgaaga aagacaaaga 180
agataaaccc ttaaagacag aaaagcgacc caagcagcct gataaagaag gaaagttaat 240
ctgttctgaa aaggggaaaag tgtcagagaa aagtcttccc aagaacgaga aggaagacaa 300
ggaaaacatt tccgaaaatg acagagagta ttctggagat gcccaagtgg ataagaaacc 360
tgaaaatgac attgtgaaga gtccacaaga aaacttgagg ggaaccnaaa ngaaaacgag 420
gcagaccccc ttccatagct nctactgctg gggattnaaa ctttaaactt tggcaccat 480
acctttggac ttnnnanaag gaaaatttca naggggtgtg agtcctttta accgtccttg 540
gttgncaaaa ntntttncng ggaaagtcaa aaacttcttt gaaaaccttg ccnangattt 600
ttnngngnac nt 612

```

<210> 401
 <211> 601
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(601)
 <223> n = A,T,C or G

```

<400> 401
ggtacggtaa ctgactccag ggtcactcat actgtgtccg tggtaacggt aagtctgcag      60
ctccatcagg atggggccct tcccagatct acaataggca gcagcaaacc ttgttgccctc      120
tcggacgcac aggatatcca ttccatccac tctcagccca ggaatgaaat cgcctctctt      180
gtagtaatca gtgctggctg ccgctctctc aacagacggt ccatttccat agcgattatt      240
ctcacagatg aaaatacaag gtaatttcca caaagctgcc atgttgtaag cttcgaatat      300
ctggccctgg ttagcagcac catcgccata taaagtcagg cagacctcat cttttccatt      360
atacttacag gctagagcaa tcccagcgcc caagggcacc tgcgctccta cgatgccatg      420
gccccgtana agtcttgga tacatgtgca tcatcctcc ttcctttagc acaanctcct      480
tttgnctgt aactgcaaaa tttntcggac ggaaaggccc cggtgnaaag taaagccgtg      540
agcccgnag gctgngatna aanggcttgt ggggttnaag cccggcttca ggtcccacag      600
a                                                                                   601

```

<210> 402
 <211> 600
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(600)
 <223> n = A,T,C or G

```

<400> 402
acctggagaa gatcaaacag cgactgtttg agaaccttag aatgctgccg cacgcacctg      60
gggtccaaat gcaggcgatt cctgaggacg ccatccctga ggagagtggc cgatgaggac      120
gaagacgacc ctgacaagcg catctcgatc tgctcctctg acaaacgaat tgctgtgag      180
gaagagttct ccgattctga agaggaggga gaggggggcc gcaagaactc ttccaacttc      240
aaaaaagcca agagagtcaa aacagaggat gaaaaagaga aagacccaga ggagaagaaa      300
gaagtcaccg aagaggagaa aaccaaggag gagaagccag aagccaaagg ggtcaaggag      360
gaggtcaagt tggcctgaat ggacctnttc agctctggct ttctgctgag tccctacgtt      420
ctttcccaac cccttaaatt tataatttct attctctggg gatttatata aaaattttatt      480
naatnttaat attcccaggg cccgaaacca agggcccgaa ctnaaggnaa ntttgcttgg      540
gtgagctntt tcaagaacca ccttgcaacc atttttccgt cttaacttta accaaaangg      600

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<210> 403
 <211> 604
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature

<222> (1)...(604)

<223> n = A,T,C or G

<400> 403

actcagtgga	tgacgagtg	ttggtgaaat	tgttgaaagg	cctgtgtctg	aaatacctgg	60
gccgtgtcca	ggaggccgag	gagaatttta	ggagcatctc	tgccaatgaa	aagaagatta	120
aatatgacca	ctacttgatc	ccaaacgccc	tgctggagct	ggccctgctg	cttatggagc	180
aagacagaaa	cgaagaggcc	atcaaacttt	tggaatctgc	caagcaaac	tacaagaatt	240
actccatgga	gtcaaggaca	cactttcgaa	tccaggcagc	cacactccaa	gccaagtctt	300
ccctagagaa	cagcagcaga	tccatggtct	catcagtgct	cttgtagctt	tgtgcagcag	360
ttccgggctg	gaagacagag	acagctggac	agagctcctg	aaaacatttc	aaaaataccc	420
ccttccctcg	gcctgccctg	cctttggggg	ccancggcac	ttcagttgga	tggcacaacc	480
tantgtatcc	gtgcnnaaan	cnaacctggc	attttcaccc	anntanccaa	gggcttttgc	540
caaggggnana	acagtggagc	ccttggcctg	ncctataaac	atacgggtac	cttggccggn	600
acnn						604

<210> 404

<211> 604

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(604)

<223> n = A,T,C or G

<400> 404

ggtactttgt	ggataagaaa	atggaggaac	acatctgatg	gagagtgggc	atttgacaac	60
aatggaacag	gtaaccagca	tgtaaaatca	aaatataagt	gtctttttta	gagctgaaag	120
ctgctgctgg	tcattcatta	atgtgtcaga	catttaatac	ggatgctgga	ccttcaaaat	180
aactgaaaaa	agaaccaaga	aaaggcggtt	ttgttttcaa	caaactttac	taaataaccc	240
cggaaaggca	atgaacgatc	tgacaattta	agctctaagt	atttaaagct	cagctagaag	300
aaagtgaggc	atgacatata	ctgtcaacgg	aggggtgaagg	aggcagattt	ctggaaaatgc	360
aatgatccca	cacatttgct	tcaaggagaa	acctgcagac	atattttcag	gtcttgctaa	420
gtaacaactg	gttatttgta	atcaatcatt	tgggaaagtc	tgctatgtag	ctaanggcac	480
tgtgaccccn	gacaacngat	gaaaaggaaa	aagcnttgac	agcaggaaaa	atccttccat	540
cttaaagaat	ttaggggaca	cctttaaagg	aaaaaaattg	ntccagcctc	atttttacia	600
ntnt						604

<210> 405

<211> 593

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(593)

<223> n = A,T,C or G

<400> 405

acttgcattt	caaagcttat	aagatataaa	tggagatttt	aaagtagaaa	taaatatgta	60
ttccatgttt	ttaaaagatt	actttctact	ttgtgtttca	cagacattga	atatattaaa	120
ttattccata	ttttcttttc	agtgaaaaaat	tttttaaattg	gaagactgtt	ctaaaaatcac	180

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ttttttccct aatccaattt ttagagtggc tagtagtttc ttcatttgaa attgtaagca 240
tccggtcagt aagaatgccc atccagtttt ctatatattca tagtcaaagc cttgaaagca 300
tctacaaatc tcttttttta ggttttgncc atagcatcag ttgataccta ctaagttttc 360
atggggagac ttccttcac acatccttat ttgaaatcac tttctgtagt caaagggtata 420
ccaaaaccaa tttatcctga actaaattct aaagtatggg tatccaacca tatacatctg 480
ggtaccaaac ataaatgctg acattcntat attatagtna aggcttaatc nacttgcagg 540
tgaatggaaa aaaaataagc ttnaacctag gattctggaa tgaggaatgc tcn 593

```

<210> 406
 <211> 591
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(591)
 <223> n = A,T,C or G

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<400> 406
actttttttt tttttttttt tttttttttg ggactgaatc ttgctctgtc gcccaggctg 60
gagtgcagtg ggcgaatctt ggctcactgc aacctctgcc tcctgggttc aagtgggtct 120
catgcctcag cctcctgggt agctgggatt acagacaagc accaccacaa ccagctagtt 180
ttttttgttt tgtttttttg agacggagtc tcgctctgtc accaggctgg agtgagtggt 240
cacaatcttg gctcactgca acctctgcct cctgggttca agagattctc ctgcttcagc 300
ctnccaagta gctgggacta caggtgcaca ccatcacacc tggctaattt ttgtattttt 360
aagtanaagc ggggtttcac catgttggcc aggctggtct caaactcctg acctcaagtg 420
aaccggccgc ttancctcca aagtgctggg attacaggcg tgagccact ggctggctg 480
accatttggt tattaacagg gcccccaana tgcnccttta ngtgaaaggg natggcccca 540
gggaacaatt nngctgaaaa acaccaaagg ccnantccat aattcnttgg n 591

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<210> 407
 <211> 463
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(463)
 <223> n = A,T,C or G

```

<400> 407
ggtactgatt ttaaaaaacta ataacttaaa actgccacac gcaaaaaaga aaaccaaagt 60
ggtccacaaa acattctcct ttccttctga aggttttacg atgcattgtt atcattaacc 120
agtcttttac tactaaactt aaatggccaa ttgaaacaaa cagttctgag accgttcttc 180
caccactgat taagagtggg gtggcaggta ttagggataa tattcattta gccttctgag 240
ctttctgggc agacttgggt accttgccag ctccagcagc cttcttgtcc actgctttga 300
tgacacccac cgcaactgtc tgtctcatat cacgaacagc aaagegaccc aaaggtggat 360
agtctgagaa gctctcaaca cacatgggct tgccaggaac catatcaaca atggcagcat 420
caccagactt caagaattta nggccatctt tcccgggtac ctg 463

```

<210> 408
 <211> 588
 <212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(588)

<223> n = A,T,C or G

<400> 408

acaaatatat	ataacttaca	tttgattgta	aggccaacgt	tcaaaagtaa	aaatgagatg	60
agctctctta	ttgttatccg	aggccaagag	gctgcaactg	tcaaggggat	gttctcacca	120
aaaggggggt	tgggggaaga	ggacacacac	aaagctaata	aaaccagaat	ccccatcccc	180
acaaaactca	tgggaacaaa	atttaaagga	taaaacaaaa	cccaccaaga	cccatattac	240
aaaccaatat	ggtaacctgt	gttcccttct	atgggatgat	tatgtcatgt	taccttagtg	300
ttaaaagatt	aacataagga	aactgcagca	atatataaaa	gatataattct	ctatagagca	360
tatttcgatt	gattccatta	aaataatgac	attagaattc	catcatangg	ttaaaaccag	420
gacaatactg	nttttntctt	atttaaaaaa	aactaccacc	taatgactgn	attggtcata	480
acctgaatgg	tgtgcaatgg	gctcttccat	gaatggctgg	cngaaacaag	cttgggncct	540
gcttgagttt	cagcttttct	ctttaattta	gtngctcaat	gataaaca		588

<210> 409

<211> 612

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(612)

<223> n = A,T,C or G

<400> 409

ggtacaaaga	tctgacatgt	cacccagggg	cccatttcac	ccactgctct	gtttggccgc	60
cagtcttttg	tctctctctt	cagcaatggt	gaggcggata	ccctttcttc	ggggaagaga	120
aatccatggt	ttgttgccct	tgccaataac	aaaaatgttg	gaaagtcgag	tggcaaagct	180
gttgccattg	gcatctttca	cgtgaaccac	gtcaaaagat	ccagggtgcc	tctctctgtt	240
ggtgatcaca	ccaatttttc	taggttagca	cctncagtca	ccatacacag	ggtaccagtg	300
tcaacttga	tgaaaatcaa	gtaatcntgg	ccagtctcta	aaatcaaata	ttgaatggta	360
tcaattcacc	cttgatgaag	gggaatcggg	ggtaaccggg	atgggtgccg	ggccttnatg	420
aagtcanca	natgaaggga	ttcctttggg	gcccccaaag	aacttttttn	attttcacaa	480
cttgnacctt	gccccggcgg	ccgttcaaaa	gggcnaattc	cagncaactg	gnggccgtct	540
aanggatcca	actcggacca	acttggcgna	anatggcaaa	ctgggttcctg	gggaaatggt	600
atccctccaa	tn					612

<210> 410

<211> 353

<212> DNA

<213> Homo sapiens

<400> 410

acgcggaagc	agtggtaaca	acgcagagta	acgcgggatg	gcacatgcag	cacaagtagg	60
tctacaagac	gctacttccc	ctatcataga	agagcttatc	acctttcatg	atcacgccct	120
cataatcatt	ttccttatct	gcttcctagt	cctgtatgcc	cttttcctaa	cactcacaac	180
aaaactaact	aatactaaca	tctcagacgc	tcaggaaata	gaaaccgtct	gaactatcct	240
gcccgccatc	atcctagtcc	tcategccct	cccateccct	cgcatecctt	acataacaga	300

cgagggtcaac gatccctccc ttaccatcaa atcaattggc caccaatggt acc 353

<210> 411
 <211> 612
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(612)
 <223> n = A,T,C or G

<400> 411
 ggtacgcggg gagagaaacc tggctttact atggcggttg gaggaacggc agtgatcaca 60
 cgtcggctgc tgggaagatc tggattctcg ttccagggtca ccatcagaaa agctaagttt 120
 gctgtatagt gaggatcagg agatctgatc ctgattgcag aaccttcctt gattacagaa 180
 tcttgggttg tatctccac ttcacccttc tagaccatcc cagaagatct ataagatttc 240
 atctgggaaa tctactaggag ttcttgggaag ggaaagaagg aagattgttg gttggaataa 300
 aaacagggtt gaatgagttc cagaaagcnn ggttctcaac ctctgggaca gcaatctgca 360
 gaagangaga acttcaaaaa accnactana agcancttgc anagaagtaa aatgagaagg 420
 ggncttctna ngaaagaaga cacttggnc acagcagaaa aaactttgac cnantnttnc 480
 caggaagana ggggggggtcc cnccttttaa naacccccctt taagatncng gnggaanacc 540
 tcanngacca nccntaaatt nnggaaaccg aaaaggggcn gtcctttttg ntncagntg 600
 cncnttaan nt 612

<210> 412
 <211> 607
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(607)
 <223> n = A,T,C or G

<400> 412
 acgcggggct ctctcgccag gcgtcctcgt ggaagtgaca tcgtctttta accctgcgtg 60
 gcaatccctg acgcaccgcc gtgatgccc ggaagacag ggcgacctg aagtccaact 120
 acttccttaa gatcatccaa ctattggatg attatccgaa atgtttcatt gtgggagcag 180
 acaatgtggg ctccaagcag atgcagcaga tccgcatgtc ccttcgcggg aaggctgtgg 240
 tgctgatggg caagaacacc atgatgcgca aggccatccg agggcacctg gaaaacaacc 300
 cagctctgga gaaactgctg cctcatatcc gggggaatgt gggctttgtg ttcaccaagg 360
 aggacctcac tgagatcagg gacatgttgc tggccaatna ggtgcccagc tgctgcccgt 420
 gctggtgccc atttgcccat gtgaangtca cttgtgcccc gcccaaaaaca cttgtcttng 480
 ggccccganaa gaacttcttt tttccaggcn ttaaaatatt cacccttaa antttcaagg 540
 ggccccattt gaaatcctgg annatnngca ttgatcaana ttganacaaa gtggnancnt 600
 ccaacc 607

<210> 413
 <211> 606
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(606)
 <223> n = A,T,C or G

<400> 413
 acagggtcaga gtcttctttt cttttctttt tgagatggag tcttgctctg ttgccagact 60
 ggagtgcagt ggtgcgatct gggctcactg caatctccac ctcccgggtt caagcgattc 120
 tcctgcctca gcctcccgag taactgggac tacagggtgtg cgccaccaag cccagctcat 180
 ttttgtattt ttagtagaga tggggtttca cgatgttggc taggatggtc tcgatctctg 240
 gtcagagtct tttctgtaaa tatccttggg aaagaagcaa ttttagactg tagctgttgc 300
 aaatgcttta aggaagaagc anaacaactg tcagtcttcc tgaaatgaag aaactacacc 360
 agggctgcta tatcagagca accccaacca gcactccaat catgatgccc gacagtggcc 420
 ccagcttgag aaccagagaa gttccagatg cagagactgt gagctcntga ctatgggaat 480
 tttngnggc ntaacccaan tttgagacna aacnaggcct tngnccccgt tttnatattg 540
 gngggatttt gcggataaan aaacttgngg gggntnctgc ggnatccatg gaacnccaaa 600
 anatng 606

<210> 414
 <211> 624
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(624)
 <223> n = A,T,C or G

<400> 414
 ggtacttttt tttttttttt tttttttttg tagatgaggt ctcgctatgt tgcccaggct 60
 ggagtgcagt tattcacagg tgcaaccaca gggcactgca gctttaaact cctggggtca 120
 agcgatcctc ctgcctcagc ctcccaaata gttgggacta gatgcacgca cnaccacgcc 180
 tgactcagga cattattctt aaaggtatta tccaggaaac agataaggtc attcataaaa 240
 cacacggntt ttttctttag ctcagtgtta acaatgaaag tagattccac tattgaagca 300
 caagttgcaa attggttaaca tagngaacat attgntgtag gaaagggggt tcagtgtgnt 360
 gtgttatatn agcncttgaa ctttttatgg gngtnataag ccnngttatc ttgncccaaa 420
 gaaannccat ttttnaggatt ngatggtttt cttannggaa nannctnggg ggnattntgt 480
 ngggcatgaa cttttatgtn ggaatcagtc ccatanaggt aaggggtttn aatccccaaa 540
 ancggggntt tttatgggaa atnnccttta cttcaaaggc caaanngatn gtnggtgtca 600
 cttcnaantt ccngannnca annng 624

<210> 415
 <211> 609
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(609)
 <223> n = A,T,C or G

<400> 415
 acgcgggtta caacggaagt aaaatctgtc gaaatgcacc atgaagcttt gagtgaagct 60

cttcctgggg	acaatgtggg	cttcaatgtc	agaatgtgt	ctgtcaagga	tgttcgtcgt	120
ggcaacngtt	gctggtgaca	gcaaaaatga	cccaccaatg	gaagcagctg	gcttcactgc	180
tcaggtgatt	atcctgaacc	atccaggcca	aataagcgcc	ggctatgccc	ctgtattgga	240
ttgccacacg	gctcacattg	catgcaagtt	tgtgtagctg	aaggaaaaga	ttgatcgccg	300
ntctggtaaa	aagctggaag	aaggccctaa	attcttgaag	tctggtgatg	ctgccattgt	360
tgatatgggt	cctggcaagc	ccatgtgttg	ttgagagctt	tctcagacta	tccacctttg	420
ggtngctttg	ctggtcgtga	natgagacag	acaggtgccn	gtgggggtggc	atcaanncat	480
gggacaanaa	aggcttnttg	gancttgcaa	aggtncncaa	nttttgncca	naagcntcaa	540
aagntaattg	aatttttccc	ctannnccgt	cncccncttt	tannanggnn	ggaaaacggc	600
ttaaanntt						609

<210> 416
 <211> 577
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(577)
 <223> n = A,T,C or G

<400> 416						
ggtacgagct	gattgggaac	gggctccaat	ggacatggct	ctgcagtcaa	aatagttagc	60
agatggacag	gttttgaaaa	tgtgagggcc	catatcatca	tanccagcaa	taaggagacc	120
aacaccatat	ggtctccggc	catatccgtt	gtgttggtat	ctgggtcttg	cttccaatta	180
gagatacaag	actgagacac	aggcagtggt	ctatcgaata	caaactctga	atncaaacac	240
tcctgacgca	taaaattaca	taacagncta	gcatnancag	taagcccccg	caattgagat	300
accaatatgg	ttgtcaacat	ggagaatttt	tttctgatga	cctgccaaact	cttgatttgc	360
gcccttttca	atgcnaaccc	aaaactggca	tgaagntttt	gnatttcaga	ccancctgnt	420
ggctgnacct	tggcttaaca	ggtttccatt	ggcntatttc	natttggaatn	aantcttgcc	480
cntggggggg	ttcnaancta	ggggccatca	nttgggtcaaa	ctgntttnta	aaccatgggg	540
gcnggctcng	gccttggttg	ctggcntcaa	caaaaaan			577

<210> 417
 <211> 570
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(570)
 <223> n = A,T,C or G

<400> 417						
ggtactaaga	atatttagaga	actggaaatc	cagttttttt	gtggtttttt	aagaaagaga	60
atctgactcc	attgcccagc	ttggagagca	gtgggtgcaat	agctggggct	acaggcgtga	120
gccaccacac	caggcctgga	aaccagttt	taattttgtga	actacaaatg	gttggcaact	180
gattccttaa	ttgttattgc	aggagttagc	ccaacatgag	tccatatgta	gtccttctct	240
ggctctggtg	gaactgtggg	aaatggtgat	gaccgtgact	tgaaatactn	agaagggtga	300
tgacaaaacaa	attccaagta	ttccatcttc	cttggaagat	cttcctctgg	ccctatgata	360
taggaagcng	gaatcaaatt	tgggctcttg	ggctaagant	aggggtatgg	aatgagcccc	420
cgtnaantgg	cttgnacttc	ttcttcgcta	atactgggcc	ctggattaaa	accttttgat	480
ttanancnata	gntagggtct	tccttcttg	ttaatcaatt	cccagaaacc	aacattccca	540

atttgggtaa natactccct tgtanaaaaa

570

<210> 418
 <211> 570
 <212> DNA
 <213> Homo sapiens
 <220>
 <221> misc_feature
 <222> (1)...(570)
 <223> n = A,T,C or G

<400> 418
 ggtacttcta cacatctgcc taacttggga atgaatgtgg gagaaaatcg ctgctgctga 60
 gatggactcc agaagaagaa actgtttctc caggcgactt tgaacccatt ttttggcagt 120
 gttcatatta ttaaactagt caaaaatgct aaaataatct gggagaaaat attttttaag 180
 tagtggtata gtttcatgtt tatcttttat tatgttttgt gaagtttgtt cttttcacta 240
 attacctata ctatgccaat atttccttat atctatccat aacatttata ctacatttgt 300
 aagagaatat gcacgtgaaa cttaacactt tataaggtaa aaatgagggt tccaagattt 360
 aataatctga tncagttctt gntattttccc aatagaatgg gactnngnnc tgttaanggc 420
 ttaagganaa aggggaagata aggggttaaaa gttgggttaat ggacccaacc ntttnaaaga 480
 aatgcnntan anaatanctt natgantaaa naaaggtncc tngcccnggc cggccggttt 540
 aaangggcca atttcnagca cncnnggcgg 570

<210> 419
 <211> 574
 <212> DNA
 <213> Homo sapiens
 <220>
 <221> misc_feature
 <222> (1)...(574)
 <223> n = A,T,C or G

<400> 419
 ggtacacctt tgactacagc tgcagaagtg ttccttttaga caaagttgtg acccatttta 60
 ctctggataa gggcagaaac ggttcacatt ccattatttg taaagttacc tgctgttagc 120
 tttcattatt tttgctacac tcatttttatt tgnatttaaa tgttttangc aacctaagaa 180
 caaatgtaaa agtaaagatg caggaaaaat gaattgcttg gtattcatta cttcatgtat 240
 atcaagcaca gcagtaaaac aaaaacccat gtatttnact tttttttagg attttttgct 300
 ttctgtgatt tttcttnttt tttgatactt gcctaacatg catgtgctgt anaantnagt 360
 taaccaggga aataaccttg ngatnatggc ctanctttta gtttangtct tatgaanttt 420
 tcattgacca attctaanca ataatgggtt annaacaccg tgntntnaaa atttctggta 480
 anttggaaat aaaagggttn nttgaaatgg gccttttcca cnnactttnt tttnncagctn 540
 tttcttggn aataagccct nggttccctga aacc 574

<210> 420
 <211> 573
 <212> DNA
 <213> Homo sapiens
 <220>
 <221> misc_feature

<222> (1)...(573)

<223> n = A,T,C or G

<400> 420

```

acctccggta gaattcgggtg aatccatctg gtcctggact ctttttggtt ggtaaactat      60
tgattattgc cacaatttca gtcctgttta ttggtctatt cagagattca acttcttcct      120
ggtttagtct tgggagagtg tatgtgtcga ggaatttatc cattcttctc agattttcta      180
gtttatttgc gtagagggtg ttgtagtatt ctctgatggg agtttgattt tctgtgggat      240
cgggtggtgat atccccctta tcatttttta ttgngtctat ttgattcttc tctctttttt      300
tatntagtct tgctagcagt ctatcaattt ntgtngatcc ttttcanaaa aaccngctc      360
ctggaattca tttaatnttt tnaaggggtt ttttngtggc ctctaatttc cttcaagttc      420
tggctctgat ttaagttaat atncctggct ttttggctac nttttgnaan gnggttggcn      480
cntgnntttt ctanntcctn ttnaantggg gatngnttnn aangccattt ttnggaannt      540
tcccgccttn ntttgggggg catttangtt nnn                                     573

```

<210> 421

<211> 582

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(582)

<223> n = A,T,C or G

<400> 421

```

ggtacgcggg ggtccgccat ttctgtggacg ccgggtgagt gagagagttg gttggtgttg      60
ggccggagga aagcgggaag actcatcgga gcgtgtggat ttgagccgcc gcatttttta      120
accctagatc tcgaaatgca tctgtgatttc tgtccattgg actgtaaggt ttatgtaggc      180
aatcttgga acaatggcaa caagacggaa ttggaacggg cttttggcta ctatggacca      240
ctccgaagtg tgtgggttgn tagaaaccca ccngctttg cttttgntga atttgaagat      300
ccccgagatg canctgatgc aatccgagag ctanattngn angaacta tgtggcctgc      360
ccgtgtnagg aattggaact ggccgnaatg gttgaaanaa agaangttcg aaaattcgtg      420
gncctnctt ctttttgng gtcgtcngnc cttnagaatg attaatcgnn nggaaggang      480
tccttcncc tttnccnann antttncant aaangaanaa agcttttttt ngcaaccgcn      540
aancaggtcc ctttttttag attggganaa atagnngagn tc                                     582

```

<210> 422

<211> 570

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(570)

<223> n = A,T,C or G

<400> 422

```

ggtactctga ggcttttagat tcagtttggg tctttggggg ggacctctat catcacgcct      60
ataatcatcc cgagagtaat catctctgga gctccacgac cgatcatccc gtctgtcata      120
tcggtcttca tagcgggtccc cgctctctct gtagtcatca tccctgcgat acccactgcc      180
aatgctctt ctgccactgc ctatccggga atcatagcct ctatcatagt ctctgctgcc      240
tcggtcatca tagcgatccc ggccaccata tcgatecata tcccggcgtg ggccatccga      300

```

tacccatccc	gatacccatc	ccgataccgg	ctgaatcata	acgatctcga	tacttgnctc	360
caaagctatc	atcacctctt	ctaggtgggt	aagtcacaa	agctgtctgg	tagcaaggac	420
gaagcccttc	aagtctggat	ctggtttggg	cagaatnccc	atTTTTatca	cnggccaaaa	480
gnaacgaatc	atccctnggc	tttaaccnng	ngcttgatcn	agcaacgtcc	acntcgaaat	540
tntcctngtt	acctananaa	ctcttcattg				570

<210> 423
 <211> 584
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(584)
 <223> n = A,T,C or G

<400> 423						
acccgggtgg	ttaaacttcg	canaatgcct	agatattatc	ctactgaaga	tttgcctnga	60
aagctgttga	nccacggcaa	aaaacccttc	agtcagcacg	tgagaaaact	gcgagccanc	120
attaccncg	ggaccattct	gatcatcctc	actggacgcc	acagggggcan	gaggggtggt	180
ttntgaagc	agctggctag	tggcttatta	cttgtgactg	gacctctggt	cctnaatcga	240
gttctctac	naagaacaca	ccaataaatt	tgtcattgcc	acttcaacca	anantcngat	300
atcagcaatg	taaaaatncc	aaancatctt	actgatgctt	actttaagaa	gangaagctg	360
cngaagccca	anacancnng	gaagggtgaga	tctttcgaca	canaagtatg	agaanttatg	420
agatttacgg	agcaangcan	ggattgatca	nganaagctt	ngggcctcac	caaatttttn	480
nccaanant	tcaaagttta	tttctntnag	tttcnnnggg	cttncttgcn	antctggggg	540
tggctttgnc	ctaattggaa	tttattnctc	ccaaaaatgg	nggn		584

<210> 424
 <211> 547
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(547)
 <223> n = A,T,C or G

<400> 424						
actcttgggt	tgtcaatggg	actttccagc	aatccacca	agagctcttt	atccccaaca	60
tcactgtgaa	taatagtggg	tcctatacgt	gccaagccca	taactcagac	actggcctca	120
ataggaccac	agtcacgacg	atcacagtct	atgcagagcc	acccaaaccc	ttcatcacca	180
gcaacaactc	caaccccgtg	gaggatgagg	atgctgtagc	cttaacctgt	gaacctgaga	240
ttcagaacac	aacctacctg	tgggtgggtaa	ataatcagag	cctcccggtc	agtcccaggc	300
tgcagctgtc	caatgacaac	gggaccctca	ctctactcag	tgtcacaagg	aatgatgtag	360
gaccctatga	gtgtggaatc	cagaacgaat	taagtgttga	ccacagcgac	ccagtcattc	420
tggaatgncc	tctatggnc	aaacgaaccc	caccatttcc	cctnatacac	taattaccgn	480
ccaggggtga	accttaagct	tttctggcat	gcagccttta	cccacctggc	acagtattct	540
tggctgn						547

<210> 425
 <211> 567
 <212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(567)

<223> n = A,T,C or G

<400> 425

ggtaccatcc	tttaatagat	ctcatacacc	agaattcaga	tcataaatga	ctgacagaat	60
atattgttgg	gcagtcctga	tttaaaacta	agactggctt	gtgggttaa	gaatatgttc	120
agtttttgaa	ttttaatagt	aactccaatt	cagtaaatgg	tatcactgtt	taccctttt	180
aaagatatga	ttagacttcg	ttagtaatgt	tcaacttttc	acaaagatgg	tgagtgccat	240
cttaaaactt	actggagatt	ggctttatat	ttagatttat	ataactgggt	atgtgaatat	300
atttaaatac	tggggaaatt	gcttcactgt	cttagaacca	agcaagattc	acctgtgttt	360
tgtgttcatt	ttcatattgc	tcttaaaggc	aaggggttga	agataaataa	ggtagcaatg	420
tctatagtgt	tggccttaac	ctatgccaat	cctaattata	attccctgga	nttnaaaang	480
gttnccttta	ccttatttgg	aanggccttt	taaatngngg	gttnntgggn	naatatttta	540
aggattattc	acccctttca	catnttn				567

<210> 426

<211> 563

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(563)

<223> n = A,T,C or G

<400> 426

ggtacaattt	gttcaaggaa	tttttgtaga	aaaatacgat	cctacgatag	aagattctta	60
tagaaagcaa	gttgaaagtag	atgcacaaca	gtgtatgctt	gaaatcttgg	atactgcagg	120
aacggagcaa	tttacagcaa	tgagggattt	atacatgaaa	aatggacaag	gatttgcatt	180
agtttattcc	atcacagcac	agtcacatt	taacgattta	caagacctga	gagaacagat	240
tcttcgagtt	aaagacactg	atgatgttcc	aatgattctt	gttggttaata	agtgtgactt	300
ggaagatgaa	agagttgtag	ggaaggaaca	aggtcaaaat	ctagcaagac	aatggaacaa	360
ctgtgcattc	ttagaatctt	ctgnaaaatc	aaaaataaat	ggtaatgaga	attttttatg	420
acctantgcg	gcaaattacc	ggaaaaactt	ccngngcctg	ggaaggctng	gcaaaaggcc	480
ttcatggcca	gntgcttaat	tatnctaaat	gccttggaac	ttttgaccag	gntctgaana	540
actgttgncc	aattcaacag	ggg				563

<210> 427

<211> 567

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(567)

<223> n = A,T,C or G

<400> 427

ggtacttttt	tttttttttt	tttttttttt	tttttgttaa	aaaccataca	tcctttttat	60
------------	------------	------------	------------	------------	------------	----

tgntaagtca	taaagaggtg	tcaaaattaa	aagcaaaaat	tacagggtaa	gacttaacaa	120
aactactagg	agcgtcaaag	gaagtgaaaa	tgggactagg	cgcggggcaa	tatgaattaa	180
tgaacatggg	aaggacaagg	atgggganaa	cggtgagcat	gtgctgaana	tactagggga	240
gaggatctgg	tgaaaaattt	gatcttanac	aagcgcttag	gtaaagaaat	aatgggataa	300
gattttctaaa	ccccactatg	gagcttaaga	gtcatcctng	ccattggcgc	tgtctctgnc	360
atcctctect	tcctcaagnc	tctttttcat	catnctttga	tccaattcca	gctgggcaat	420
tccccgcatc	tttnattatc	atcatcattc	cantangggn	ccntttctta	ggaannngtn	480
ttttggnccc	cccttaanat	ttcaatttcc	cttnnnccca	ttttttttan	ggagntttgtg	540
gcnttgcccc	ttttnggntt	aaaaatn				567

<210> 428

<211> 578

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(578)

<223> n = A,T,C or G

<400> 428

ggtaccctat	gaacctgact	ctgtgggtcat	ggcagaagct	cctcctgggg	tagagacaga	60
tcttattgat	gttggatnca	cagatgatgt	gaagaaagga	ggccctggaa	gaggagggag	120
tgggtggcttc	acagcaccag	ttggtggacc	tgatggaacg	gtgccaatgc	ccatgccccat	180
gccccatgct	atgccatctg	naaatacngc	ctttctcata	tccactgcca	aagggaccat	240
canatttcaa	tggactgcca	atggggacct	atcaggcctt	tnccaatatt	catccacctt	300
cagataccag	cnactcccc	atcgatgaa	tctgnanatg	acattaatgc	tgataatgaa	360
tatctctttt	tgcacanatt	gttgggtcctg	gaccccagcc	aanaancctt	tgcaaanctt	420
nctttccaga	cctggaggat	tacttatnga	cacntttgtc	cctaaccaga	agttgnccat	480
ttnggcceng	aacancactt	tcccaactgg	canttnngctg	gateccagnn	ccttcnggat	540
ttggaanaac	nttggctttt	gatggatttt	ttccccgg			578

<210> 429

<211> 572

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(572)

<223> n = A,T,C or G

<400> 429

ggtaccaaga	gtttgctcct	ggctgctttg	atgtcagtgc	tgctactcca	cctctgcggc	60
gaatcagaag	cagcaagcaa	ctttgactgc	tgtcttggtg	acacagaccg	tattcttcat	120
cctaaattta	ttgtgggctt	cacacggcag	ctggccaatg	aaggctgtga	catcaatgct	180
atcatctttc	acacaaagaa	aaagtgtgtc	gtgtgcgcaa	atccaaaaca	gacttgggtg	240
aaatatattg	tgcgtctcct	cagtaaaaaa	gtnaagaaca	tgtaaaaact	gtggcttttt	300
ctggaatgga	attggacata	gcccangaac	agaaagaacc	ttgctgggct	ggaggtttca	360
cttgacatc	atggaagggt	ttagtgttta	atctaatttg	ggcctcactg	gacttngncc	420
atttaatgaa	gttnantcat	tattgnnatc	atagtttgct	ttgtttnaan	ccttnncatt	480
taaagttaaa	actggaattt	nanggtaatt	tnaacttgta	nggtttcctg	ggtttagctt	540
tttaaatcnt	aattttttcca	taagcnnntt	tg			572

<210> 430
 <211> 591
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(591)
 <223> n = A,T,C or G

```

<400> 430
ggtacagccc aggtaatctg ctgagcctaa tgggtgtcag ggtcagtcta agtgaaggca      60
aagagaggct gggatgaagg gtgcaaagga atagtaaaga aagcatgttt gagatccana      120
acagaataat gggtagtaga gggaggtatt gaggatagaa nagtatatgg gtttggcacc      180
acgggggtgga taggcaaaac atttggttga taangcgcag attctgaact aacttgtaag      240
gcttgctctgg ttttaggaca ggtaaaatgg nggaatggta aggagaagtt tataggtttt      300
atgagcccat gctgtancca gcaagtata actngctttt aatccctttt cnaaagcaat      360
gcctggngnt atgaagnata tttggcattt gatcnggggt tnaangngtg attagngttn      420
ctantgaaca atngnaaagg ggntgccatg atcngtnncc caaggatgng attttanggn      480
antctcntac ttgtgggggt naaggggtggn gggnttttac naggnngggc cccnaagggn      540
gcctnttggn tntangnaat aaanggccng nnaatngana atccnnnttn n              591
  
```

<210> 431
 <211> 565
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(565)
 <223> n = A,T,C or G

```

<400> 431
accagtgatg ttttgatata agcatataat gtttaatgat caagtcagga taaatgggggt      60
atccatcacc tcaagcacat ataatacttt ctttgattta ggcataattca aattccactc      120
ttttagttat ttttaaatat ccagtaaatt agatcttatt cattctatct agatgtattt      180
ttgtacttta tttttctcaa atattttttac ttatgctttt tgctattatc cacagtgttt      240
ttttttaaag cctgagccac tttgtgggtt cagcctcaat ataataatca tccccttact      300
cttagactaa ttccttttcc cctgncactt tgcctgtata ctctgtaaaa atgangacct      360
tagaaaatca acatttcttg gtgaactttg agagactatt acaagcagtg cccaaaacag      420
tangaataag gcaggtaaaa ccagttggga tagccagatn tattattgat ctggtnggac      480
aaanggataa nttggngggc atgggtttcca nggcantcgn gaattcccca ttagctttaa      540
gggtcnatnn angntggccc angggg
  
```

<210> 432
 <211> 578
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(578)

<223> n = A,T,C or G

```

<400> 432
acgcggggggc caccgtggag agcagagcgc ggcggctgga agctgctaag tcagagccgc      60
gatgttccgg attgagggcc tcgcaccgaa gctggacccg gaggagatga aacggaagat      120
gcgcgaggat atgatctcct ccatacggaa ctttctcatc tacgtggccc tcctgcgagt      180
cactccattt atcttaaaga aattggacag catatgaaga caggacatca catatgaatg      240
caccgatatg aagagcctgg ttacagtttc gactcctctc tgnaagtga taggccaga      300
aaggtgtaag agactctttg aatggacata aaattctgct tgtnagaac caagttttgg      360
ntctgggtna ctgacctttc aaaagctaaa attttaaaac tattttgggg aagtttttta      420
tttnnttatt nntcngtttn ttnataaaaa agtaccttgg tnccggnacc accntttaag      480
ggccnaattn cagncnnt ngngggccgn ttacttttng ggatnntaa ntctggganc      540
cnaancttgg ggggtaantc angggtcata nnctggtt      578

```

<210> 433

<211> 563

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(563)

<223> n = A,T,C or G

```

<400> 433
acttcttctg gccaaaggct gttccacatt cactacattt aaaaggcttc tctccaatat      60
ggattttctc atgctcagta aggttggatt tgccactgaa ggtttttcca cactccttac      120
atacaaaggg cttctctcct gtgtgagttc tctggtgtct gatgaggttt gacttctgaa      180
tgaaagcttt cccgcaatct ttacactcaa aagggtttttc tccagtgtga attttctggg      240
gcgtaaggag gttttccttc tggctaaatg attttccaca ttcattacat tcgaaaagct      300
tctcgccagt atgggtgttc tgatgtttta tgacatactg cttttggcta aaggcttttc      360
cacactcggt acattcaaaa gggttctctc tccgtgtgaa aatgctcatg ctcantgang      420
tttgaattgn nggcttgaag acttttccca tacccttaca ggcaaanggg gttttcccn      480
ttggaanatn tntggtgcn tnaagntggg gacatctgga tnggaaacct tttcncatt      540
tccaaagggn ttttttcnn nag      563

```

<210> 434

<211> 563

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(563)

<223> n = A,T,C or G

```

<400> 434
ggtacagctg tctgcattga aaattcatgc atggagaaaag ggagtaagca agggagaaac      60
ggtgcgattc acatattccg cgagatcatc aagccagcag agaaatccct ccatgaaaag      120
ttaaacaag ataagcgctt tagcaccttc ctcagcctac ttgaagctgc agacttgaaa      180
gagctcctga cacaacctgg agactggaca ttatttgtgc caaccaatga tgcttttaag      240
ggaatgacta gtgaagaaaa agaaattctg atcgggacaa aaatgctctt caaaacatca      300
ttctttatca cctgacacca ggagttttca ttggaaaagg atttgaacct ggtgttacta      360

```

```

acatttttaa gaccacacaa ggaaacaaaa tcttttcttg aaagaaagta aatngatcca 420
cttctgggtga atgaatttga aattcaaagg aatctggcct tcatgccanc aaatgggggt 480
aattcatgnt ggagaataac ctctttatc cagccgnaca cacctgttgg aaatggatcc 540
aactgctgga aattncttaa taa 563

```

```

<210> 435
<211> 558
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc_feature
<222> (1)...(558)
<223> n = A,T,C or G

```

```

<400> 435
ggtagcgggg ggaagatggc ggccgtgcag gcggccgagg tgaaagtgga tggcagcgag 60
ccgaaactga gcaagaatga gctgaagaga cgcctgaaag ctgagaagaa agtagcagag 120
aaggaggcca aacagaaaga gctcagtgag aaacagctaa gccaaagccac tgctgctgcc 180
accaaccaca ccactgataa tgggtgtgggt cctgaggaag agagcgtgga cccaaatcaa 240
tactacaaaa tccgcagtca agcaattcat cagctgaagg tcaatgggga agaccatac 300
ccacacaagt tccatgtaga catctcactc actgacttca tccaaaaata taagtcacct 360
gcagcctggg gatcacctga ctgacatcac cttaaagggtg gcaggtagga tccttccaaa 420
agancctntg ggggaaactn antcttctnt tgaactttca aggaaanggg tgaagtttgc 480
agtcatgggc caattccaga aattttaaat cagnagaaga atttttccta ttaataccaa 540
ctgggtcggg ggagactn 558

```

```

<210> 436
<211> 528
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc_feature
<222> (1)...(528)
<223> n = A,T,C or G

```

```

<400> 436
ggtacaaaaa aaaccttaca taaattaaga atgaatacat ttacaggcgt aaatgcaaac 60
cgcttccaac tcaaagcaag taacagccca cgatgttctg gccaaagaca tcagctaaga 120
aaggaaactg ggtcctacgg cttggacttt ccaaccctga cagaccgcga agacaaaaca 180
actggttctt gccagcctct agagaaatcc cagaacactc agccctgaca cgttaatacc 240
aagggggaaca gttaactcca atacaaggctc aaaatcagca acaagttcta caatccagtg 300
ctgatatcag atacaaagct tcaagggcaa tttcttttcg aaggcttatt ccagtttcgt 360
gaggctagca tgaagtgtgt gcatttgcca ggggcaaatt tctattctca attaaccat 420
gcagcaaant gctacgcac tggttgagtc cgggttanaa nccatttgcc ggnnggaccaa 480
tggaaggggc ccgaattcgt cnnaacttgn cccgggcggg ccgttcaa 528

```

```

<210> 437
<211> 576
<212> DNA
<213> Homo sapiens

```

<220>
 <221> misc_feature
 <222> (1) ... (576)
 <223> n = A,T,C or G

<400> 437

actttttttt	ttttttttt	ttttttttt	aggtttgagg	gggaatgctg	ganattgtaa	60
tgggtatgga	gacatgtcat	ataagtaatg	ctaggggtgag	tggttaggaag	ttttttcata	120
ggaggtgtat	gggttggtcg	tagcggaatc	gggggtatgc	tggtcgaatt	cataagaaca	180
gggagggttag	aantaggggtc	ttggtgacaa	aatatgttgt	gtagagttca	gggganagtg	240
cgtcatangt	tggtcctagg	aanattgtac	nggtgagggg	tgtttattat	aataatgttn	300
gggtatccgg	ctntgaaana	atngggccaa	ngggcctgcg	gtgtattcga	ngttnaaacc	360
tgagactagt	tcggactccc	ntttgcaagg	ncccaaaggg	ggttngggtt	ggcccttgct	420
annggtgnga	naataaatch	tntttattgg	cccaagggtt	cttaacngcn	aggagttaat	480
ccaaagggtt	ncntnggntt	ttnnnanaaa	nggttgtnaa	aagggttaaag	ggacccncct	540
ttntnnntaa	tgntcgnaat	gtcaaatnga	tngcnn			576

<210> 438
 <211> 576
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1) ... (576)
 <223> n = A,T,C or G

<400> 438

ggtaccccaa	ttaccagtat	ggtggaccct	accccttctt	ctctgcattg	ggaaacagaa	60
cagagaacag	aaaaaatcat	tccatcttgc	tcttaactct	ttccacctat	gtgctcagtt	120
tttcaagtag	aattttctatt	cctttgctgg	tgcttttggt	tttttccaat	gtaggaatca	180
agcttttcag	tgcaagctttg	actttgtttg	caacttccag	gtcacaactc	tggaggaggc	240
tagaaagaat	aatggcacct	cgattttacac	tagcccagga	cttcagggtc	ttcataccaa	300
catgctctac	aagtgttttt	gcaaaacaac	cttctcttcc	attntctttt	catcttttta	360
tcttgctcta	ttaaccactt	nagaaactaa	gaatgtccct	gcaaggatgt	tctggcaatg	420
ntgaaagctt	ctccgtcctt	ggccaccagg	atgcaagtcc	ntggttnttg	ccagcttggc	480
cnatnggcat	tccatnggna	nggcttgaac	cgttttccag	ggggcagant	cccaaatgg	540
ccngacacca	accnacang	cagacttntt	ttagcn			576

<210> 439
 <211> 578
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1) ... (578)
 <223> n = A,T,C or G

<400> 439

cgaggtagcg	gggggagaaa	aaacctgcgg	aaaatggtag	cgatggcggc	tggggccgagt	60
gggtgtctgg	tgccggcggt	tgggctacgg	ttgttggttg	cgactgtgct	tcaagcggtg	120
tctgcttttg	gggcagagtt	ttcatcggag	gcatgcagag	agttaggctt	ttctagcaac	180

ttgcttttgc	gctcttgtga	tcttctcgga	cagttcaacc	tgcttcagct	ggatcctgat	240
tgcagaggat	gctgtcagga	ggaagcacia	tttgaaacca	aaaagctgta	tgcaggagct	300
attcttgaag	tttgnggatg	aaaattggga	aggttccctn	aagtccaanc	ttttgttang	360
agtataaaa	cccaaactgt	tcagaaggac	tgccaaatna	aagtatgtnn	cgtgggttca	420
aacntgaat	taaaaggctt	ttngaccaac	atngggnaa	attgcttgan	nacttgtcca	480
tttcttaaaa	ttgggaacnc	tggaccnggt	nanaaanatt	tcngattgga	aaantttgga	540
ccncatttta	aatcttgctt	aaattttggc	caatcctt			578

<210> 440

<211> 573

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(573)

<223> n = A,T,C or G

<400> 440

ggtacttttt	tttttttttg	agacaggggc	ttgccctgtc	acccagggctc	gagtgcactg	60
gagtgatcac	agctcactgg	cctcaagtga	tctctctgcc	ttggcccttt	aagtgccagg	120
gttacaggca	tgagctacca	tgccctggcag	aaattcaaga	ttgggataaa	cttacttctt	180
tgccaagcct	gttcttcaag	ttattcagaa	ctgggtgtat	accttgctct	catatgtatc	240
ttgtccctgc	tgtcttttag	gttagcaagg	tgtatgaata	cttttaagtt	ttgtttgttc	300
ttttcctcgt	ggtatcaagt	gaaatactga	tctattctct	ggctaggggc	aatttacaaa	360
attgccatgg	aactgagcca	aaaggcccca	cgtgggataa	aaattnctta	ccatcgacgc	420
ccanccgtan	tttttcaagg	tattggcttt	tggaagnntt	accaaatttc	nggtaaacca	480
aaattcnaaa	agnaaaaaat	tnccttgng	taaccttgcc	cgggcggccg	ttcaaaaagg	540
cnaatttcca	ncacattggg	cggccgttaa	tna			573

<210> 441

<211> 572

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(572)

<223> n = A,T,C or G

<400> 441

ggtacaaaaat	tttattaaag	gtcttttagag	agcaacatcc	agactccaga	atacagctgc	60
caaggagacc	ctgttatgct	gtgggggactg	gctggggcat	ggcagggcggc	tctggcttcc	120
cacccttctg	ttctgagatg	gggggtgggtg	gcagtatctc	atctttgggt	tccacaatgc	180
tcacgtggtc	aggcaggggc	ttcttagggc	caatcttacc	agttgggtcc	cagggcagca	240
tgatcttcac	cttgatgcc	agcacaccct	gtctgagcaa	cacgtggcgc	acagcagtgt	300
caacgtagta	gttaacaggg	gtctccgctt	gtggatcatc	aagccatcca	caaacttcat	360
ggatttagcc	ctctgncctt	cggaggttcc	cagacaccca	caanctngca	agcctttggc	420
cccacttttc	catgatgaaa	ctgnagncac	aaccatangc	aagggccctt	cggacannta	480
aggccttcct	aaggagnttg	naacnana	naacttttgc	ttgggcantg	ggcacaccag	540
nacntntaag	nggccccctt	tttaagcata	aa			572

<210> 442

<211> 562
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(562)
 <223> n = A,T,C or G

<400> 442

acaggtcaga	gtcttctttt	cttttctttt	tgagatggag	tcttgctctg	ttgccagact	60
ggagtgcagt	ggtgcgatct	gggtcactg	caatctccac	ctcccgggtt	caagcgattc	120
tcctgcctca	gcctcccag	taactgggac	tacaggtgcg	cgccaccaag	cccagctcat	180
ttttgtattt	ttagtagaga	tggggtttca	cgatggtggc	taggatggtc	tcgatctctg	240
gtcagagtct	tttctgtaaa	tatccttggg	aaagaagcaa	ttttagactg	tagctgttgc	300
aaatgcttta	aggaagaagc	aaaacaactg	tcaagtcttc	ctgaaatgaa	gaaactncac	360
cagggctgct	atatcagaac	aaccncaacc	aagcacttca	aacatgatgc	cgacaggtgg	420
ccccagctta	aaaaaccagg	aanaagttcn	gantccnnaa	actgngaag	cctcttggac	480
ttttggaatt	aattgggggc	cagtagccaa	gttatnagac	caaatacang	cntagggccc	540
cgtattattt	ggcggggatt	tg				562

<210> 443
 <211> 585
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(585)
 <223> n = A,T,C or G

<400> 443

acttttattt	tttggtggtg	aaattgactg	atgattttcc	tttttcttcg	ctggactatt	60
gtgccaactg	ccaggtgccc	tcctgccctt	acagccctaa	gtggctgcct	tccttccatc	120
aactcccaac	ttcttctgtg	gaagtttaat	tgtctcaacg	cctccccctc	ccccattccc	180
tccatttttc	tccaagaaa	cctgactcaa	ttatttgc	attttgagaa	actgctgcag	240
attagttctt	tttgccagtt	ttccctggaa	ctcctggcct	tttgtggagg	ggagggatgg	300
agagaatagg	aatcttcact	agaagccgtg	ggaagaattg	gaagttacat	gctgtatatg	360
caatgtccag	cagtctgata	aactgacgat	tcttaatcaa	gattttttcc	tgatggggaa	420
gggactttta	ttttctttta	nagaggggaa	agtgtgagct	cttcccttat	tcctaattggc	480
tatttttgaa	gcaanaaagg	ccacaacatt	ngcacatgcc	acctgcnaag	gaccttgagt	540
nagtgaagnc	tcctaaaact	gggttaanaa	ccttggtttc	tctnn		585

<210> 444
 <211> 437
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(437)
 <223> n = A,T,C or G

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<400> 444
acgcggggac gtgactcagc acttttcccca gagcccggaac tgcggagaac aatatacctcc      60
tccctaacag ataaacagcc cttgttcctc gggataagga ctggcagtc cctgacaccc      120
taagaccggc atctgtcgat gttatttccc cagcatggcc gaaacagaag ccctgtcgaa      180
gcttcgggaa gacttcagga tgcagaataa atccgtcttt attttgggag ccagcggaga      240
aaccggcaga gtgctcttaa aggaatcct ggagcagggc ctgttttcca aagtcacgct      300
cattggccgg aggaagctca ccttcgacga ggaagcttat aaaaatgtga atcaagaagt      360
ggtggacttt gaaaagttgg atgactacgc ctctgccttt caaggtcatg atgttggaat      420
ctgtgcctgg gtacctn

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<210> 445
<211> 592
<212> DNA
<213> Homo sapiens

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<220>
<221> misc_feature
<222> (1)...(592)
<223> n = A,T,C or G

```

```

<400> 445
actttttttt tttttttttt tttttttttt taagggttga gggggaatgc tggagattgt      60
aatgggtatg gagacatatc atataagtaa tgctagggtg agtggttaga agttttttca      120
taggaggtgt atganttggc cgtagcggaa tcgggggtat gctgttcgaa ttcataagaa      180
cagggagggt aaaagtaggg tcttggtgac aaaatatgtt gtgtanagtt caggggaaag      240
tgcgtcatat gttgttccta ggaanattgt antggtgagg gtgttaatta taataatgtt      300
tgtgtattcg gctatnaana atagggccaa atgggcctgc ngcctattcn atgtttaanc      360
tgagacttnt tcggactccc ctccggcaan gtcnaantgg gggtcgggtg ngcncgtcag      420
tgnggagata nntcntntta ntggccaatg gtnnnngatg ccagaataat cannanggnt      480
tcnttntcn tnaaaaggtc naaatggttn angganaccn cttattagga attgttaatc      540
ttnaatgatn gttntggnga cncatatatg anaatgtnag gnctactccn ng      592

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<210> 446
<211> 599
<212> DNA
<213> Homo sapiens

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<220>
<221> misc_feature
<222> (1)...(599)
<223> n = A,T,C or G

```

```

<400> 446
ggtacggcaa acacaacgga cctgagcact ggcataagga cttccccatt gccaaaggag      60
agcgccagtc cctgttgac atcgacactc atacagccaa gtatgaccct tccctgaagc      120
ccctgtctgt ttcctatgat caagcaactt ccctgaggat cctcaacaat ggtcatgctt      180
tcaacgtgga gtttgatgac tctcaggaca aagcagtgtc caaggaggga cccctggatg      240
gcacttacag attgattcag tttcactttc actgggggtt acttgatgga caaggttcat      300
agcatactgt ggataaaaag aaatatgctg cagaacttca cttgggtcac tggaaacacca      360
aatatgggga ttttgggaaa gctgtgcagc aacctgatgg actggccgtt ctaggatatt      420
tttttgaagg ttggcagcgc taaaccnggc cttnataaag ttgttgaatg tgctggattc      480
cattaaaaca aagggcaaga attgctgact ttcactaatt nnaatcctcg tnggccttct      540
tcctgaaatc cttggattac cggacctncc cagcttactn accanccttc tcttttngg      599

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<210> 447
 <211> 588
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(588)
 <223> n = A,T,C or G

<400> 447
 ggtacgcggg atgagtgtgg aatccagaac aaattaagtg ttgaccacag cgacccagtc 60
 atcctgaatg tctctatg cccagacgac cccaccattt cccctcata cacctattac 120
 cgtccagggg tgaacctcag cctctcctgc catgcagcct ctaaccacc tgcacagtat 180
 tcttggtgga ttgatgggaa catccagcaa cacacacaag agctctttat ctccaacatc 240
 actgagaaga acagcggact ctatacctgc caggccaata actcagccag tggccacagc 300
 aggactacag tcaagacaat cacagtctct gcggagctgc caagccctcc atctccagca 360
 acaactccaa acccgtggag gacaaggatg ctgtggcctt ccctgtgaac ctgaggctca 420
 gaacacaacc tacctgtggt gggtaaatgg tcagagcctc cagcagtcct aaggctggag 480
 ctgtccaatg gcaacangga cctnactcta ttcaatgtca caagaaatga cncaagaacc 540
 tatgnatgtg gaatccagaa ctnagtgtat caaaccgaat gaccagnn 588

<210> 448
 <211> 593
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(593)
 <223> n = A,T,C or G

<400> 448
 accatttgtc tgacctctgt aaaaaatgtg atcctacaga agtggagctg gataatcaga 60
 tagttactgc taccagagc aatatctgtg atgaagacag tgctacagag acctgctaca 120
 cttatgacag aaacaagtgc tacacagctg tgggtcccact cgtatatggt ggtgagacca 180
 aaatggtgga aacagcctta accccagatg cctgctatcc tgactaattt aagtcattgc 240
 tgactgcata gctctttttt ttgagaggct ctccattttg attcanaaaag ttagcatatt 300
 tattaccaat gaatttgaaa ccagggtctt tttttttttt ttgggtgatg taaaacncaa 360
 ctncctgnca ncaaaataat taaaatagnc acattgntat cttttattag gtaattcact 420
 tcttaattan atggnatcaat actctaagna tcaaaatntt ccaattatna tggctcacct 480
 gaaagaagna tgctctttta aggaatacag cttcttcnat tnacaattta acanggggag 540
 aaaattaaan tnaangantt ganatctgga ggngtannaa ngntctcgcn ttc 593

<210> 449
 <211> 577
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(577)

<223> n = A,T,C or G

<400> 449

actgtgggtc	gaagtaatgg	atacggacgt	aaccatcttc	gccgccgctg	ctgtagctct	60
tgccatcagg	atggaaggca	acactgttga	taggtccaaa	gtgacccttg	actcttccaa	120
actcttcttc	aaaggccaaa	tggaagaacc	tggcctcaaa	cttgccaatc	ctgggtggagg	180
ttgtggttac	atccatggct	tcctgaccac	cgcccaggac	cacatgggtca	tagttggggg	240
agagggcagc	tgagttgaca	ggacgttctg	tccggaaaagt	cttctgatgt	tcaagagttg	300
tggagtcaaa	aagcttggct	gtgttgtcct	tggacncggc	acaaacatgg	tcatgtccct	360
ggataactgg	atgtcgttga	tctgccggga	gtgtctctta	acattcacca	acacctcttc	420
anacttggca	ctatactggg	tgactctcca	ctcttatggc	cnggatgatg	cactccccca	480
aggggtncca	aacagnactg	gtgatttaga	atcattgcan	ggatcttatg	tagggctcat	540
tgntgcaatc	tggcttggat	ccgcagtcaa	aaaagnt			577

<210> 450

<211> 575

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1) ... (575)

<223> n = A,T,C or G

<400> 450

ggtacttgtg	atcacactac	gggaatctct	gtggtatata	cctggggcca	ttctaggctc	60
tttcaagtga	cttttgaaa	tcaacctttt	ttatttgggg	gggaggatgg	ggaaaagagc	120
tgagagttta	tgctgaaatg	gatttataga	atatttgtaa	atctattttt	agtgtttggt	180
cgttttttta	actgttcatt	cctttgtgca	gagtgatat	ctctgcctgg	gcaagagtgt	240
ggaggtgccg	aggtgtcttc	attctctcgc	acatttccac	agcacctgct	aagtttgtat	300
ttaatggttt	ttgtttttgt	ttttgtttgt	ttcttgaaaa	tgagagaaga	gccggagaga	360
tgatttttat	taattntnt	tttttttttt	tactatttat	agctttaaaa	agggcctncc	420
ttccccctct	ctttcttttg	netctttcat	taaccctctc	ccagtttttt	tttaacttaaa	480
ccccgttctc	atggcctngg	ccttttgaag	cgnttctctc	tataaaaagc	tttgccgaac	540
aanttttttt	taccgatccc	aaatttatga	agggg			575

<210> 451

<211> 573

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1) ... (573)

<223> n = A,T,C or G

<400> 451

actaggctaa	ctagaaggat	ctcatcccca	tatgtggtct	catttcaagt	ctatggatga	60
ctaccttcat	tgctgtgtgc	gagatggttt	cacccttga	aaatatgggc	acttcagcat	120
aaaatagtta	aatctttata	atgatcaatt	catectacct	ccttttacat	gcagctgaaa	180
aatgacaggc	tagggacata	gaatattgtg	aactttatac	tgtagaatc	actgtccatt	240
aatgatcac	tagctaattg	tcactaaatt	tacaaattaa	ggaaattata	tatagaatac	300
tgcaaaaaca	cagtaaaaag	actgaagtcc	gccattttct	gctcaggaag	tctcttcaact	360

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cctaagcttc atatgttgcc ttctggcttc aaaattctgc tattattact gttttcctcc 420
tttgatcttc ctttgggtccc cagtgccaga cttccaagcc ttttngttaa aaagccatct 480
tttggatgcc atttcnaaca gcttcagtga tgcctctgaa aaaaggatct gccggctaen 540
atttctcngg ttctgtgctt ctaccgganc tcc 573

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<210> 452
<211> 595
<212> DNA
<213> Homo sapiens

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<220>
<221> misc_feature
<222> (1) ... (595)
<223> n = A,T,C or G

```

```

<400> 452
acaattttat ccctaaaact ctgttgacat caaaatatga cagttgctat atccataaaa 60
tatttacata gcacggcata ttaagcttta gacacttggc aattaaacca cataaaaaga 120
ggacaagacc cccatcctac atgtttggaa tcaggtgttc accggtccct atctggcgac 180
tgtacgcggg tggggtcctt acttgatttc tgttatcagc tgattttgaa acatataata 240
atgattttct tgttcccttc tttaactagc tgcctttaga ttttgataat cacagtctta 300
aaatactagg aaagaagtgg atgggaattg taggcataga tttcatatca agggcatttc 360
aagacagaat ttttaattcc tgtagtaggc ttgctggagc naaaggaaaa tgtgctgggt 420
aaaaatcaac ttatgccatt ttaaaatttg ataaaatttg gagtggcatn ctgctaaggg 480
gagaccttgg gccggacccc cttangggca aattcngca cactgggggg cggtactang 540
gggatccgac ntcggnccan acttggcgna tcatgggctt antgttcctt gnggn 595

```

```

<210> 453
<211> 380
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc_feature
<222> (1) ... (380)
<223> n = A,T,C or G

```

```

<400> 453
ggtacgcggg gagccgcctg gataccgcag ctaggaataa tggaatagga ccgcggttct 60
attttgttgg ttttcggaac tgaggccatg attaagaggg acggccgggg gcattcgtat 120
tgcgccgcta gaggtgaaat tcttggaccg gcgcaagacg gaccagagcg aaagcatttg 180
ccaagaatgt ttccattaat caagaacgaa agtcggaggt tcgaagacga tcagataaccg 240
tcgtagttcc gaccataaac gatgccgacc ggcgatgcgg cggcgttatt cccatgaccc 300
gccgggcagc ttccgggaaa ccaaagtctt tgggttcggg ggggagtatg gttgcaaaaa 360
aaaaaannaa aaaaaaaagt 380

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<210> 454
<211> 589
<212> DNA
<213> Homo sapiens

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```

<220>
<221> misc_feature

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<222> (1)...(589)

<223> n = A,T,C or G

<400> 454

ggtactcttg	gtttatcaat	gggacgttcc	agcaatccac	acaagagctc	tttatcccca	60
acatcactgt	gaataatagc	ggatccctata	tgtgccaaagc	ccataactca	gccactggcc	120
tcaataggac	cacagtcacg	atgatcacag	tctctggaag	tgctcctgtc	ctctcagctg	180
tggccaccgt	cggcatcacg	attggagtgc	tggccagggg	ggctctgata	tagcagccct	240
ggtgtatttt	cgatatttca	ggaagactgg	cagattggac	cagaccctga	attcttctag	300
ctcctccaat	cccattttat	cccatggaac	cactaaaaac	aaggctctgt	ctgctcctga	360
agccctatat	gctggagatg	gacaactcaa	tgaaaattta	aagggaaaaac	cctcaggcct	420
gangtgtgtg	ccactcagag	acttcaccta	actagagaca	gtcaaactgc	aaccatgggt	480
gagaaattga	cgacttcaca	ctatggacag	cttttnccaa	gatgtcaaac	aagactcctc	540
atcatgataa	ggntcttacc	cctttaattg	nccttgttat	gcctgcct		589

<210> 455

<211> 589

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(589)

<223> n = A,T,C or G

<400> 455

ggtacgcgga	agagacaggg	tttcaccatg	ttgcccaggc	tggtttcgaa	ctcctgacct	60
caggtgatcc	acccgcctcg	gcctcccaaa	gtgctgggat	tacaggcttg	agccccgcg	120
cccagccatc	aaaatgcttt	ttattttctg	atatgttgaa	tactttttac	aattcaaaaa	180
aatgatctgt	tttgaaggca	aaattgcaa	tcttgaaatt	aagaaggcaa	aaatgtaaag	240
gagtcaaaac	tataaatcaa	gtatttgagg	agtgaagact	ggaagcta	ttgcattaaa	300
ttcacaaact	tttatactct	ttctgtatat	acattttttt	tctttaaaaa	acaactatgg	360
atcagaatag	ccacatttag	aacacttttt	gttatcaagt	caatatTTTT	agatagttag	420
aacctgggtc	taagcctaaa	agtgggcttg	attctgcagt	aaatcnttta	caactgcctc	480
gacacacatt	aaccttttta	aaaatngacc	ttcccgaagt	cttttggtag	catgggnacac	540
ctgatgctta	natgttcang	taattaatat	ggnccagnag	tnttgttnc		589

<210> 456

<211> 582

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(582)

<223> n = A,T,C or G

<400> 456

acagaatggt	gatacaaagc	ttaaaattct	tgcatatggg	catagaaaat	gcactcttgg	60
ttttgtgttt	ttatcacttg	cttccaactt	aggcttttgg	ctcagaagat	tattgaataa	120
tgatttgtct	tagtttctgt	ttcagtaagg	gaattcttag	gccgttgcta	tgataccatc	180
attaagacat	tcacatgtct	tcatataata	tctcttcatt	tcaaataccta	atcactattt	240
catactatta	cagggctttg	atgctgccag	cactgtcttt	tacataggaa	attctagatt	300

tgcacagtaa	tagaggaatt	agaagtacct	aactatacac	tttgattcag	cctgctaaat	360
caggggttca	atactagctt	ggacaaaactt	tgtaagtaat	taattgctac	cagccttatt	420
ggaaacaaat	tatcaactag	tttccccctgc	caaattttga	aattcactgn	ttcacttaat	480
ctattatatt	actaataatg	gattaataaaa	gatgaattaa	ttattattac	ttactagtnt	540
aaatgaaaaa	caggggactga	aatagtcctgn	atccnggttg	ca		582

<210> 457
 <211> 380
 <212> DNA
 <213> Homo sapiens

<400> 457						
ggtacttttt	tttttttttt	tttttggagt	ttttagttta	ttaatgttct	tgcgaaaaat	60
ccacagtggc	cacagctaac	atcattgcag	cacctttact	ccttcggctg	tgatccaatc	120
tccagctcac	ttctttttgc	cagcaccaac	attggccttt	gcagtccccc	tgactttctt	180
cattctgttc	ttgcgttcct	ttcgttgctt	tcttgaggtc	tttttcttct	catacaggcc	240
atgtcttgca	agtctatgtt	tgggttcatt	tttctttgca	taatccaggg	aatcataaat	300
catgccaaag	ccagttgtct	tgccaccacc	aaaatgagtt	ctgaatccaa	atacaaagat	360
gacatccggt	gtggtcttgt					380

<210> 458
 <211> 382
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(382)
 <223> n = A,T,C or G

<400> 458						
acgcggggag	aacagccacc	cctctctcgg	gcactgctgc	catgaatgcc	ttcctgctct	60
ccgcactgtg	cctccttggg	gcctgggccc	ccttggcagg	aggggtcacc	gtgcaggatg	120
gaaatttctc	cttttctctg	gagtcagtga	agaagctcaa	agacctccag	gagccccagg	180
agcccagggt	tgggaaaactc	aggaactttg	cacccatccc	tggtgaacct	gtgggtccca	240
tcctctgtag	caacccgaac	tttccagaag	aactcaagcc	tctctgcaag	gagcccaatg	300
cccaggagat	acttcagagg	ctggaggaaa	tcgctgagga	cccgggcaca	tgtgaaatct	360
gtgcctacgc	tgccctgtacc	tn				382

<210> 459
 <211> 592
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(592)
 <223> n = A,T,C or G

<400> 459						
ggtactgagg	aaatatatttg	ttaaagtgagc	tttgggtata	acttagcccc	atcattatatt	60
agagaataga	ggaggaagaa	agaggaagga	ttttaaaaggc	agacaatgac	agaccattca	120
ggataggtag	ggttttaaaag	ggagataaac	acagtctcat	caactaagga	gagatttgct	180

```

gcagtaaata ggatgagggga aatagtctgt gggatgcaag caaaggaagc aggggtgcctt 240
agacactgag tggagccaga aagatcatgc ggcctttttc caagtacatg gccaccaagt 300
aagaatgggt ggtgacaaga cagaaggcta aaacaggaag gtaatcttgt gcacctgaca 360
aatngaaaga attaaggatc aaaattgaag caggctntaa gagtttcaag aaattcttaa 420
aaccctaaaag tgatttggaa gcccctaaact ttccggtaat gctncccatg gcatgatggg 480
ccaaaacctt ggggggttcc aagttnnaaa agccctntnc caaattttta tggacccctt 540
acattttttc taatcaatcc cccctttcca aaaaaatngg acctcntttt tt 592

```

```

<210> 460
<211> 578
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(578)
<223> n = A,T,C or G

```

```

<400> 460
acgcgggcac tatcctgaat tatgtgcctg tctagataag cagagaccat gccaaagcta 60
taatggaaaa caagttttaca aagagacctg tatctctttc ataaaagact tcttggcaaa 120
aaatttgatt atagttattg gaatagcatt tggactggca gttattgaga tactgggttt 180
ggtgttttct atggtcctgt attgccagat cgggaacaaa tgaatctgtg gatgcatcaa 240
gctatcgta gtcaaaccct tttaaaatgt tgctttggct ttgtaaattt aaatatgtaa 300
gtgctatata agtcaggagc agctgtcttt ttaaaatgtc tcggctagct agaccacaga 360
tatcttctag acatattgaa cacatttaag atttgagggg tataagggaa aatgatatga 420
atgtgtattt ttactcaaaa taaaagtaac tgttacgttg cgaaaaaaan nnnnnnnnnn 480
naaaaaaaag tnccttgggc cgggaccacg ctagggcaaa tccagcacac tggcggcctg 540
actagggatc cactnggacc agctggcgna atatggnn 578

```

```

<210> 461
<211> 425
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(425)
<223> n = A,T,C or G

```

```

<400> 461
acgcggggct ttctggtctc ggccgcagaa gcgagatgac gaagggaacg tcatcgtttg 60
gaaagcgctg caataagacg cacacgttgt gccgccgtg tggctctaag gcctaccacc 120
ttcagaagtc gacctgtggc aaatgtggct accctgccaa gcgcaagaga aagtataact 180
ggagtgccaa ggctaaaaga cgaaatacca ccggaactgg tcgaatgagg cacctaaaaa 240
ttgtataccg cagattcagg catggattcc gtgaagggaac aacacctaaa cccaagaggg 300
cagctgttgc agcatccagt tcatcttaag aatgtcaacg attagtcatg caataaatgt 360
tctggtttta aaaaatnnan nnnnaannntn nttnnaaanaa aaaaagtntc nggccgngac 420
cacgc 425

```

```

<210> 462
<211> 581
<212> DNA

```

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1) ... (581)

<223> n = A,T,C or G

<400> 462

ggtactattg	accacagcat	gggggcttcg	acatgggctt	tagggagtc	taagtggagt	60
ccgtaaagag	gtatctttac	tataaaagct	attgtgtaag	ctagtcatat	taagtgtgtg	120
gctcaggagt	ttgatagttc	ttgggcagtg	agagttagta	gtagaatgtt	tagtgagcct	180
aggggtgttg	gagtgtaaat	tagtgcgatg	agtaggggaa	gggagcctac	taggggtgtg	240
aataggaagt	atgtgcctgc	gttcaggcgt	tctggctggg	tgcctcatcg	ggtgatgata	300
gccaaagtg	ggataagtgt	ggtttcgaag	aagatataaa	atatgattag	ttctgtggct	360
gtgaatgtta	taattaagga	gatttgtaag	ggagattagt	atanagaggt	anagtttttt	420
tcgtgatagt	ggntcactgg	ataantggcc	gttggctttg	ccatgattgt	gaggggtagg	480
agtcaagtag	ttagtattan	ganggggggt	nttaggggtc	cnaggaaaang	ttggggaana	540
ctaaannggt	gtngtnattn	gtaaaaaata	nnnnnanggat	n		581

<210> 463

<211> 574

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1) ... (574)

<223> n = A,T,C or G

<400> 463

actgtgtggc	gccttattct	aggcacttgt	tgggcagaat	gtcacacctg	ccgatgaaac	60
tcttgcgtaa	gaagatcgag	aagcgggaacc	tcaaattgcg	gcagcggaac	ctaaagtctc	120
agggggcctc	aaatctgacc	ctatcggaaa	ctcaaaatgg	agatgtatct	gaagaaacaa	180
tgggaagtag	aaaggttaaa	aaatcaaaac	aaaagcccat	gaatgtgggc	ttatcagaaa	240
ctcaaaatgg	aggcatgtct	caagaagcag	tgggaaatat	aaaagttaca	aagtcctccc	300
agaaatccac	tgtattaagc	aatggagaag	cagcaatgca	gtcttccaat	tcagaaccaa	360
aaaaaaaaaa	aaaaaaaaag	tacttttttt	ttttnnnnnt	tttttttttt	taggtaatgg	420
gtgttgagct	tgaacgcttt	cttaattggn	ggctgctttt	angcctctat	gggtgttaaa	480
ttttttactc	tcttacaagg	tttttcctaa	gtccaaanac	tgtccttttg	gctacagtta	540
aatttccagg	ggattaaagg	gttttgggcn	aatt			574

<210> 464

<211> 580

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1) ... (580)

<223> n = A,T,C or G

<400> 464

ggtacctagt	aagctctccc	tctctcccacc	ctccaccctc	aaggaggccc	cagtgtcagt	60
------------	------------	-------------	------------	------------	------------	----

tggtccctc	tgggtccatg	agttcttctc	atttagctcc	cacttataag	caagaacatg	120
cagtatttgg	ttttctgttc	ctgccttagt	ttgctaagga	taacggcctc	cagctccatc	180
cagttcctgc	aaaggacatg	atcctgttct	ttctatggct	gtatagtatt	ccatgggtga	240
tatttaccac	attgtcttta	tccagtctgt	cattgatggg	cttttgggtt	gattagtagc	300
tttttgaatg	gtaacttttc	tacagaagta	cgcggggctt	ttttttttgc	tgtaggcccg	360
gggtggttgc	gccgaaatgg	gcangttcat	gaaacctggg	aagggtggtgc	ttgtcctgct	420
ggacgctact	ncggacgcaa	agctgtcatc	gtgaaagaac	attgatgatg	gcaccttana	480
cgccttacag	ccatgctctg	gtggctggaa	ttgaccgcta	cncccgaag	tgacagctgn	540
catgggcaag	aagaagatcg	ccagagatca	aagataaaan			580

<210> 465

<211> 578

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)... (578)

<223> n = A,T,C or G

<400> 465

gggtactttt	ttttttttt	ttttttttt	ttctacatca	ctttanaata	tttattgtat	60
tccttaatgc	atttcttaac	atgtatagca	ctctttaatc	aagaatataa	agtcactctac	120
ttagaatcac	attatcttaa	agatgcatac	tggaaatgata	agtttgaaga	tgtaactatc	180
aacaattctt	ttcaaaatca	tatcaatata	ttactctcat	ggaacttgca	cattctaaga	240
agggtcattt	tttcccccca	gtaccaatat	tacattatct	gacagggata	ataaaatgag	300
cagagactgg	aaatcacaga	caataacatt	gctttctcaa	ttaacagaaa	ggattcataa	360
catattcctt	aacggtagat	gtgatttgta	gagaatgtgg	aaaagaacta	ttgagaagtc	420
cacctgctgc	ccaaactgag	gcacattagg	gtggttggtg	gangagttat	atttgagggt	480
ccatttttcc	ttagggttta	aaagcatgtc	cnggttgng	gtnatttgcc	attaagtctn	540
ttttcaata	aaagaattag	gggagaaagt	ttggaaaa			578

<210> 466

<211> 546

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)... (546)

<223> n = A,T,C or G

<400> 466

accaatacca	ccaattttgt	agacatcctg	gagaggcagg	cgcaagggct	tgtcagttgg	60
acgagttgg	ggtaggatgc	agtccagagc	ctcaagcagc	gtggttccac	tggcattgcc	120
atccttacgg	gtgactttcc	atcccttgaa	ccaaggcatg	ttagcacttg	gctccagcat	180
gttggtacca	ttccaaccag	aaattggcac	aaatgctact	gtgtcggggg	tgtagccaat	240
tttcttaatg	taagtgtgta	cttccttaac	aatttctca	tatctcttct	ggctgtaggg	300
tggctcagtg	gaatccattt	tgtaaacacc	gacaattagt	tgtttcacac	ccagtgtgta	360
agccagaang	gcatgctctc	gggtctgccc	attcttggag	ataccagctt	caaattcacc	420
aacaccagca	gcaacaatca	ggacagnaca	gtcggntcga	gatgtccctg	taatcatggt	480
ttgataaaag	tctctgtgtc	ctggggcatc	aatgatagtc	acatagtacc	tcggccgcga	540
ncacgc						546

<210> 467
 <211> 445
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(445)
 <223> n = A,T,C or G

<400> 467
 acctaaaacc cgaagaacct tctgtaagaa gtgtggcaag catcagcctc acaaagtgc 60
 acagtataag aagggaagg attctttgta tgcccaggga aggaggcgct atgatcggaa 120
 gcagagtggc tatgggtggc agacaaagcc aattttccgg aagaaggcta agaccacaaa 180
 gaagattgtg ctaaggctgg aatgtgttga gcctaactgc agatccaaga ggatgctggc 240
 tattaagaga tgcaagcatt ttgaactggg aggagataag aagagaaagg gccaaagtgat 300
 ccagttctaa actttgggat atttttcttc aattttgaag agaaaatggg gaaccataga 360
 aaagttaccg gagggaaaat aaatacagtg atattccaaa aaaaaaaann nnnnnaaaaa 420
 aaagtncttg gccgggaccc cctaa 445

<210> 468
 <211> 566
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(566)
 <223> n = A,T,C or G

<400> 468
 actgtgtggc gccttattct aggcacttgt tgggcagaat gtcacacctg ccgatgaaac 60
 tcctgcgtaa gaagatcgag aagcggaacc tcaaattgag gcagcgggaa ctaaagtctt 120
 agggggcctc aaatctgacc ctatcggaac ctcaaaatgg agatgtatct gaagaaacaa 180
 tgggaagtag aaaggttaaa aaatcaaaac aaaagcccat gaatgtgggc ttatcagaaa 240
 ctcaaaatgg aggcattgtc caagaagcag tgggaaatat aaaagttaca aagtctcccc 300
 agaaatccac tgtattaagc aatggagaag cagcaatgca gtcttccaat tcagaaccaa 360
 aaaaaaaaaa nnaaaaaaag tacttttttt tntnnnnnnn ttttttttag gaatgggtgt 420
 tgaacttgac ctttcttaat gggggctggg tttaggctat atggngtaaa tttttctctt 480
 ttacaagggt tttcctagng ncaaaaactg tcctttggac taccgtaaata tacaggggtt 540
 taaaggtntt ggggcaatta aanttn 566

<210> 469
 <211> 586
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(586)
 <223> n = A,T,C or G


```

<400> 469
acgcgggata ggtttggtcc tagcctttct attagctctt agtaagatta cacatgcaag      60
catccccgtt ccagtgagt caccctctaa atcaccacga tcaaaaggga caagcatcaa      120
gcacgcagca atgcagctca aaacgcttag cctagccaca cccccacggg aaacagcagt      180
gattaacctt tagcaataaa cgaaagttaa actaagctat actaacccca gggttggtca      240
atttcgtgcc agccaccgcg gtcacacgat taaccaagt caatagaagc cggcgtaaag      300
agtgttttag atcaccctct ccccaataaa gctaaaactc acctgagttg taaaaaactc      360
cagttgacac aaaatagact acgaaagtgg ctttaacata tctgaacaca caatagctaa      420
gacccaaact gggattagat accccactat gcttagccct aaacctnaca gttaaataca      480
caaaactgct cgccagacac tcgagccaca gcttaaaact caaggacctg cgggcttcat      540
atccctctag angacctgtc tgtaatcgat aaccccgatc aacctn                      586

```

```

<210> 470
<211> 487
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc_feature
<222> (1)...(487)
<223> n = A,T,C or G

```

```

<400> 470
acggccaggg ctattggttg aatgagtagg ctgatggttt cgataataac tagtatgggg      60
ataaggggtg taggtgtgcc ttgtggtaag aagtgggcta gggcattttt aatcttagag      120
cgaaagccta taatcactgc gcccgcctcat aaggggatgg ccatggctag gtttatagat      180
agttgggttg ttggtgtaaa tgagtgaggc aggagtccga ggaggttagt tgtggcaata      240
aaaatgatta aggatactag tataagagat cagggttcgtc ctttagtggt gtgatgggt      300
atcatttggt ttgaggttag tttgattagt cattgttggg tgggtgattaa tcngttngtg      360
atgaaatatt tggaggtggg gatcaatana gggggaaata gaatgatcag tacctcgccc      420
gcgaccacgc taagggccaa tccacacact ggcggnccgt ctaatggatc ccaactcgga      480
ccagctt                      487

```

```

<210> 471
<211> 488
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc_feature
<222> (1)...(488)
<223> n = A,T,C or G

```

```

<400> 471
actgcggcgg gtaggcctag gattgtgggg gcaatgaatg aagcgaacag attttcgttc      60
attttgggtc tcagggtttg ttataatttt ttatttttat gggcttttgt gagggaggta      120
gggtggtagt tgtgtttaat atttttagtt gggtagtgag gaatagtgtg aggagtagtg      180
gggtaattat ggtgggccat acggtagtag ttagttgggg cattcccgcg tacctatttg      240
tatttttggt agagacaggg ttttgccatg ttggccagga tggctctgaa ctactgacct      300
caggtgatcc tcacgccttt atctcccaaa gtgctgcgat tacaggcatg aggcaccact      360
cctggccaca ttcttatatt taaaaaaaaa gcacaactct attgtctact ggtgttcttt      420
tacctgaagt tcaaactcta gctcttcaaa aaaaaaaaaa aaaaaaaagta cctnggccgc      480
naccacnc                      488

```

<210> 472
 <211> 586
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(586)
 <223> n = A,T,C or G

```

<400> 472
ggtacttgat gccctccaag caattaaaac caagggcaaa cgagcccat tcacaaattt    60
tgacccctct actctccttc cttcatccct ggatttctgg acctaccctg gctctctgac    120
tcacccctct ctttatgaga gtgtaacttg gatcatctgt aaggagagca tcagtgtcag    180
ctcagagcag ctggcacaat tcagcagcct tctatcaaat gttgaagggtg ataacgctgt    240
ccccatgcag cacaacaacc gcccaaccca acctctgaag ggcagaacag tgagagcttc    300
atcttgatga ttctgagaag aaacttgtcc ttcctcaaga acacagccct gcttctgaca    360
taatccagta aaataataat ttttaagaaa taaatttatt tcaatattag caaagacagc    420
atgccttcaa atcaatctgt aaaactaaga aacttaaatt ttagttctta ctgcttaatc    480
aaataataat tagtaagcta gcaaatagta atctgtaagc ataagcttat gcttaaatca    540
gttttagttg aggaatcttt aaaattacca ctaantgatt gnatgg                    586

```

<210> 473
 <211> 575
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(575)
 <223> n = A,T,C or G

```

<400> 473
ggtacaaagg ggaaagggtg catgccaaact atcgaattat aggatatgta aaaaatataa    60
gtcaagaaaa tgccccaggg ccgcacacac acggtcgaga gacaatatac cccaatggaa    120
ccctgctgat ccagaacgtc acccacaatg acgcaggaat ctatacccta cacgttataa    180
aagaaaaatct tgtgaatgaa gaagtaacca gacaattcta cgtattctcg gagccacca    240
agccctccat caccagcaac aacttcaatc cgggtggagaa caaagatatt gtgggtttta    300
cctgtcaacc tgagactcag aacacaacct acctgtgggtg ggtaaacaat cagagcctcc    360
tggtcagtc caggctgctg ctctccactg acaacaggac cctcgttcta ctcacgcca    420
aagaatgaca taggacccta tgaatgtgaa atacagaacc cagtgggtgc caccgcant    480
gcccantcac cctgaatgtc cgtatgagtc aatcctgccg gcggccgttc naanggcgaa    540
ttccacacac tggcggccgt ctaatggatc cactc                    575

```

<210> 474
 <211> 515
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(515)

<223> n = A,T,C or G

<400> 474

ggtacgtggg	ggactcaact	gaaatcatgg	cgtttgacag	cacttggaag	gtagaccgga	60
gtgaaaacta	tgacaagttc	atggaaaaaa	tgggtgttaa	tatagtgaag	aggaagcttg	120
cagctcatga	caatttgaag	ctgacaatta	cacaagaagg	aaataaattc	acagtcaaag	180
aatcaagcgc	ttttcgaaac	attgaagttg	tttttgaact	tgggtgtcacc	tttaattaca	240
acctagcaga	cggaactgaa	ctcaggggga	cctggagcct	tgagggaaat	aaacttattg	300
gaaaattcaa	acggacagac	aatggaaacg	aactgaatac	tgtccgagaa	attataggtg	360
atgaactagt	ccagacttat	gtgtatgaag	gagtagaagc	caaaaggatc	tttaaaaagg	420
attgaccatt	attcttggcg	cacagtccaa	aatncaaatt	ggccagaaga	tctatattgn	480
acctgcccgg	gcggccgttc	gaaaggccaa	ttcca			515

<210> 475

<211> 580

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(580)

<223> n = A,T,C or G

<400> 475

acaaagatct	gacatgtcac	ccagggaccc	atttcaccca	ctgctctgtt	tggccgccag	60
tcttttgtct	ctctcttcag	caatggtgag	gcggataccc	tttcctcggg	gaagagaaat	120
ccatggtttg	ttgcccttgc	caataacaaa	aatgttgga	agtcgagtgg	caaagctgtt	180
gccattggca	tctttcacgt	gaaccacgtc	aaaagatcca	gggtgcctct	ctctgttggg	240
gatcacacca	attcttccta	ggttagcacc	tccagtcacc	atacacaggt	taccagtgtc	300
gaacttgatg	aaatcagtaa	tcttgccagt	ctctaaatca	atctgaatgg	tatcattcac	360
cttgatgagg	ggatcggggt	agcggatggt	gcgggcatca	tgagtcacca	gatgagggat	420
tccttttgtg	ccccaaagat	ctttctnact	ttgacaactt	gaccttggnc	gcgaccaccc	480
taaggcgaat	tcacccactg	gcggccgtct	aatggatccn	nctcggncca	acctggntat	540
atggcntaan	tnntccnggn	naaatntntc	ccncaatcc			580

<210> 476

<211> 593

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(593)

<223> n = A,T,C or G

<400> 476

ggtactatgt	gggacagtat	tttgcaaata	caagaagagc	tcagggcagc	tgtggagctg	60
gatgggtctgc	ctggcaggcc	tctgtgcagt	ctgcctgtct	atcctgtccc	ctttttgggg	120
cttgatcctc	ttctcggtgt	catgcttcc	catgtatact	tacttatctg	gccaagaatt	180
gttacctgtg	gatcagaagg	cagtcctggt	gacaggtgtg	attgccccgt	tggccatgct	240
ttgtgcaagt	atctggatga	gctgggcttc	acggtatttg	ccggagtttt	gaatgaaaat	300
ggcccaggag	ctgagggaatt	gcgaagaacc	tgctctccgc	gcctctcggt	gctccaaatg	360
gacatcacga	accagtgcag	ataaaaagatg	cttacagcaa	ggttgcaaca	atgctgcagg	420

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acaaaagact gtgggctgtg atcaacaatg ctnggggtgct tggcttttcc actgatgggg 480
agcttnttnt tatgatgact acnaacaatc ntggccgnga acttttttga actgngaggg 540
acaaaacggt tttccttttt taaaaaancc aagggngggtg gnnaattncn nnt 593

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<210> 477
<211> 595
<212> DNA
<213> Homo sapiens

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<220>
<221> misc_feature
<222> (1)...(595)
<223> n = A,T,C or G

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<400> 477
actacaaggt ttagcatttg ctctgctggt cgacattccc ccagtctatg gggtgtatgc 60
atcctttttc ccagccataa tctacctttt cttcggcact tccagacaca tatccgtggg 120
tccgtttccg attctgagta tgatgggtggg actagcagtt tcaggagcag tttcaaaagc 180
agtcccagat cgcaatgcaa ctactttggg attgcctaac aactcgaata attcttcaact 240
actggatgac gagaggggtga ggggtggcggc ggcggcatca gtcacagtgc tttctggaat 300
catccagttg gcttttggga ttctgcggtt tggatttgta gtgatatacc tgtctgagtc 360
cctcatcagt ggcttcaacta ctgctgctgc tgttcatgtt tttggnttcc caactcaaact 420
tcatttttca agtgacagtc ccgtcacaca ctgatncagt ttnaatttta aaagtacctc 480
ggcgcgcganc accctaaggc gaattttnaac ccactngcgg ccgttctant ggatccaact 540
ngnnncaaac ttngngaata ngggcataac ngntcctggg gaaatnnttc ccnct 595

```

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<210> 478
<211> 420
<212> DNA
<213> Homo sapiens

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<220>
<221> misc_feature
<222> (1)...(420)
<223> n = A,T,C or G

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<400> 478
ggtagacagt atgtataaca atgcatacta tgggtgtggag ttaattccaa ttaccatatt 60
ttatatattat tggtcacaac agcatacatt ttatgctcca aaatacatgg atctgacaaa 120
atgggttacat ttaatgttct tttaaagaaa gatgaactaa atttaagaag aattgggtttt 180
tcctaataatc tcatttttcaa attactgata caaatttgcc agagaaacaa ttacatgttt 240
tacctaacat caaataatct ccagtttcta agacagatgc atttcttgtt caatttccaa 300
aagtaaatata aggctttcta actgaaaaca tttgcatccc tagctctcta aagtaattaa 360
aaagaaaatt acaaaaaaatg acctctaagc ttctgaacag ccacttant tacataaagt 420

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<210> 479
<211> 602
<212> DNA
<213> Homo sapiens

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<220>
<221> misc_feature
<222> (1)...(602)

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<223> n = A,T,C or G

<400> 479

ggtacctagt	cagatggtag	acgagctgtc	tgctgccgca	ggagcacctc	tatacaggac	60
ttagaagtag	tatgttattc	ctgggttaagc	aggcattgct	ttgccctgga	gcagctat	120
taagccatct	cagattctgt	ctaaaggggt	tttttgggaa	gacgttttct	ttatcgccct	180
gagaagatct	accccagggg	gaatctgaga	catcttgcct	acttttcttt	attagctttc	240
tcctcatcca	tttcttttat	acctttcctt	tttggggagt	tgttatgcca	tgatttttgg	300
tatttatgta	aaaggattat	tactaattct	atttctctat	gtttattcta	gttaaggaaa	360
tgttgagggc	aagccaccaa	attacctang	ctgagggttag	agagattggc	cagcaaaaac	420
tgtgggaaga	tgaactttgt	cattatgatt	tcattatcac	atgattatag	aaggctgtct	480
taatgcaaaa	aacatactta	catttnanac	atattccaan	gggatctcnc	attttgtaaa	540
aagttgacta	ttactggagt	aaaccctggt	ttccctaant	ttaacttttt	ttgggaaatt	600
at						602

<210> 480

<211> 600

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(600)

<223> n = A,T,C or G

<400> 480

ggtacttttt	tttttttttt	tttttttttc	ggtttgaggg	ggaatgctgg	anattgtaat	60
gggtatggan	acatgtcata	taagtaatgc	tagggtagt	ggtaggaagt	tttttcatag	120
gaggtgtatg	agttggtcgt	agcggaatcg	ggggtatgct	gttcgaattc	ataaaaacag	180
ggaggttana	agtagggctc	tggtgacaaa	atatgttggt	taaagttcag	ggganagtgc	240
gtcatatggt	gttccttagga	aaattgtagt	ggtagagggg	tttattataa	taatgtttgt	300
gtattcgggt	atgaaaaata	gggcgaaggg	gcctgcggcg	tattccatgt	tgaagcctga	360
gactagttcg	gactccccct	cggcaagggtc	caaaggggtt	ccggttggtc	tcttctagt	420
tgagataaaa	tcatattatg	gccnaggggtc	atgatggcag	gagtaatcaa	aggggtcntt	480
tgttttgaaa	aagggnnggan	aggttaaagg	ancccccttt	tataatgggtg	atantaaaaa	540
gatgcttggg	ggactcnttt	aaaatgttgg	ctcttcttcc	angcncccac	aggcgtat	600

<210> 481

<211> 594

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(594)

<223> n = A,T,C or G

<400> 481

cgaggtacgg	ccagggctat	tggttgaatg	agtaggctga	tggtttcgat	aataactagt	60
atggggataa	gggggtgtagg	tgtgccttgt	ggtaagaagt	gggctagggc	atttttaatc	120
ttagagcgaa	agcctataat	cactgcgccc	gctcataagg	ggatggccat	ggctaggttt	180
atagatagtt	gggtgggttg	tgtaaataag	tgaggcagga	gtccgaggag	gttagttgtg	240
gcaataaaaa	tgattaagga	tactagtata	agagatcagg	ttcgtccttt	agtgttgngt	300

atgggttatca	tttgttttga	ggtagtttg	attagtcatt	gttgggtggt	gattantccg	360
ttgttgatga	gatatttgga	ggtagggatc	aatagagggg	gaaatagaat	gatcagtacc	420
tgcccnngcg	gncgctcgaa	anggcgaatt	ccaccacact	ggcgggcn	ctaattggatn	480
cgaccnngtc	ccaacttgcg	taatcatggc	atacttgtn	ctggtgaaat	ggtatccctc	540
acaattccca	cacatacaac	ccgaacctaa	atgtaaanct	gggggcctat	natn	594

<210> 482
 <211> 600
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1) ... (600)
 <223> n = A,T,C or G

<400> 482						
accatgaaat	acatatat	cataagggtc	agttacaaaa	tggattgttt	caaattggcaa	60
tttcttacac	taacctgatt	atgaaaaaaaa	gaagtctgta	tcattctgctt	ccaagtctgt	120
tatgtccaaa	tatat	ttatgcattt	attttgctac	ttttataaat	attagagatt	180
tcaccttaaa	ttat	aactagttct	agaacatggt	ttccaattat	tatttttcta	240
atggagacat	ataattgacc	tatgtttatg	catatatggt	ctctacacag	tgaaactttt	300
tttaaaaaaga	atagtaaaga	aaatgcgga	gctctggctc	tccaaggcaa	agtcaaaaaa	360
aaaaaaaaaag	cgggggggaa	tgcgaggaac	attttattac	acctnctgat	tttctcctt	420
gagnttttatt	ttctccctt	ggntatttgt	taatgctaga	aactgnattc	ctaanaaagc	480
atacctcttt	caggngagcn	tgataattgg	gaanaatttt	gttcctttag	tntgaacatt	540
ttattaagaa	gngattccta	ataaaganac	aangggctnt	ttaattnttt	gggggnngga	600

<210> 483
 <211> 605
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1) ... (605)
 <223> n = A,T,C or G

<400> 483						
acagaacatc	gtcagcacta	gcacagttta	cagaacctca	cagacccaaa	ggaacatcaa	60
taggcaaagc	gactacagga	ggcgtgtgtc	cgcgtgggcg	aggtaaagag	ggtcagtatt	120
ggtcaagtga	cagtgtcgg	aatctggcaa	gacagtgatg	ttaagaaggt	tcatagttta	180
agaattatct	aaaatatttt	aaaaactata	aagctgcaac	acatgatttt	tacacctagt	240
tactagaaaa	ctaaggaaa	cacttattag	ctctgaataa	agtaacatgg	aaagcacttt	300
tactaatcga	caaaaaaacc	ttctaattgca	ttatcagaaa	gattttataa	tacaaggagg	360
catattgctc	agtcagaagg	ggttctataa	gaaaagcact	tactaagtta	gcgactaaca	420
gaacaaccng	tttaaagatg	aattaaatgc	cccatttggg	gangcatggc	aggtgttaag	480
anaaangaaa	agcntaagaa	aacatttnct	ggttatanca	aaccttntt	tnttatctac	540
tgnatttgac	aaaaattaac	cntttaaagt	tttaccnng	cacttnnttc	nttgctctcg	600
gccc						605

<210> 484
 <211> 591

<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(591)
<223> n = A,T,C or G

<400> 484

ggtacgcggg	tggggagacc	ctggggtagc	agccactgac	ctcacacctg	gaggaagctg	60
tgtgaccgat	tcatgagctt	atgcctgaag	acagagcaag	cactccccgc	accacgacga	120
tgacgttcac	ttgttttgtg	tttttcgatc	tcttcaacgc	cttgacctgc	cgtcttcaga	180
ccaagctgat	atgtgagatc	ggcttttctca	ggaaccacat	gttcctctac	tccgtcctgg	240
ggtccatcct	ggggcagctg	gcggtcattt	acatcccccc	gctgcagagg	gtcttccaga	300
cggagaacct	gggagcgctt	gattttgctgt	ttttaactgg	attggcctca	tccgtcttca	360
ttttgtcaga	gctcctcaaa	ctatgtgaaa	aatactgttg	cagccccaaa	gagagtccag	420
atgcaccttg	aaagatgtgt	agtggaccgc	acttccgcgg	naccttccta	atnatttcaa	480
ctgggtgnga	ctgtggccct	gccctgtttc	ttcttagggg	agactttang	anggcgagcn	540
tcataccgga	tagttttctt	taggaaactn	aggaaccttg	gctcaggacc	a	591

<210> 485
<211> 605
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(605)
<223> n = A,T,C or G

<400> 485

ggtacgcggg	gatataaagg	gagagagcaa	gcagcgagtc	ttgaagctct	gttnggtgct	60
tnggatccat	ttccatcggn	ccttacagcc	gctcgtcaga	ctccancagc	caanatgggtg	120
aancagatcg	agagcaagac	tgcttttcan	gaagccttgg	acgctgcang	tgataaactt	180
gtagnagtgt	actttctcagc	cacgtgggtgt	gggccttgca	aaatgatcaa	gcctttcttt	240
cattccctct	ctgaaaagta	ttccaacgtg	atattccttg	aagtagatgt	ggatgactgt	300
caggatgttg	cttcagagtg	tgaagtcaaa	tgcatgccaa	cattccagtt	ttttaagaag	360
ggacaaaagg	tgggtgaatt	ttctggagcc	aataaggaaa	agctttgnag	ccnccattaa	420
tgaatgagtc	taatcatgtt	ttctgaaaac	ataaccagc	catttggtta	tttaaaactt	480
gnaanttttt	nagntaccna	aatttaaagt	ctgaagacat	aaccgggtgc	catttgcggtg	540
acaatnaaaa	attatgccaa	cacttttttna	anaanganan	nnntttcctn	gggaaatngt	600
anccc						605

<210> 486
<211> 319
<212> DNA
<213> Homo sapiens

<400> 486

ggtaccagtt	gtagccataa	agattctggg	actcattatg	gactactaga	aggacctcct	60
tcccttctgc	gacattgaac	ggcacgacat	caatattggg	ctgggcactg	tttggcaggt	120
tccagaaggt	taaaagcgag	gctgtgagca	ggagtccctg	ccagggaatg	cacactctgt	180
atggacaggc	tgaaggggac	cccatgggtct	ctgctgcctg	cttgtcctct	gtggagaaga	240

gcttgggctc caggaactct cttgtcaggg ctgctgtgac tgtcagctct gctgtccttc 300
ctacctctgt gtccccggt 319

<210> 487
<211> 586
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(586)
<223> n = A,T,C or G

<400> 487
acgcgggagc tgagtgtccc gcggggcccg aagcgtttac tttgaaaaaa ttagagtgtt 60
caaagcaggg ccgagccgcc tggataccgc agctaggaat aatggaatag gaccgcggtt 120
ctattttgtt ggttttcgga actgaggcca tgattaagag ggacggccgg gggcattcgt 180
attgcgccgc tagaggttaa attcttggac cggcgcaaga cggaccanag cgaaagcatt 240
tgccaagaat gttttcatta atcaagaacg aaagtcggag gttcgaagac gatcagatac 300
cgtcgtagt ccgaccataa acgatgccga ccggcgatgc ggcggcggtta ttccatgacc 360
cgccgggcag ctttcnggaa accaaagtct ttgggttncc gggggagtat ngttcnaaaa 420
aaaaaaaaaa aaaaaaaagt cctnggccgg ganccctta ngnggaaatt cagccactgg 480
nggcgttctn atggatncna gctcggncca acntggcgta atatggcata cttgttctctg 540
gngnaaatgt ttccctccaa attccccaaa tacgggcgga gcttaa 586

<210> 488
<211> 487
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(487)
<223> n = A,T,C or G

<400> 488
acagctgggt ggacctatct atgcatcttc accagcagct ggagcatctc cacccttgggt 60
atttctgggt taaattactt gagctctgtg ctttgaaacc agtttgataa gtcctttact 120
aaggagctcc tgaagggtcg ccctggccag ggagcctcga atcttcagtc tctcagagac 180
cacagctggg gttataagtt tatagttggg aacttcctta cagagtttat cataggtagc 240
tttgtcaaac aagactaagt tattgagctt gtcccgaact ttgcctttgg accacttctt 300
ctttttggcc ttgccccggg atttgttcac tgggtctttg tctttcttgg ccgactttcc 360
agcgtccttc ttcttcttgt cgtccttaag cggcattgag aantcgggag aataagcaac 420
aaacaccgca cctcgtcnaa gatgtcggac aaaaaaaggc cccgcgtacc ttnggccgcg 480
ancacnc 487

<210> 489
<211> 589
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature

<222> (1)...(589)

<223> n = A,T,C or G

<400> 489

acgcgggggtc	tctcctcagg	cagcagcaac	gcggaggaaa	cgaggagtga	cgagagcgt	60
agtgaccatc	atgagcctcc	tcaacaagcc	caagagtga	atgacccag	aggagctgca	120
gaagcgagag	gaggaggaat	ttaacaccgg	tccactctct	gtgctcacac	agtcagtcaa	180
gaacaatacc	caagtgtcga	tcaactgccg	caacaataag	aaactcctgg	gccgcgtgaa	240
ggccttcgat	aggcactgca	acatgggtgt	ggagaacgtg	aaggagatgt	ggactgaggt	300
acaaagatta	aattaagaca	cggtaaattg	actaaatatt	tgggttttat	ataaataaag	360
gtcataacca	caccgttgac	atgtaatact	gttataatac	aacagttaaa	ctttgtgagt	420
ctcaacagaa	gtcatctgta	gttnaacagg	aaacaaaagt	tgaaaaaaaa	catgttnaaa	480
caaaactctg	ggactaacag	gtcgggattg	taagtacaac	caacatatct	ctcacttctg	540
ggtntttcaa	gtttacagta	cttggccgga	cccccttang	ggnattcac		589

<210> 490

<211> 591

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(591)

<223> n = A,T,C or G

<400> 490

ggtaccggga	tagtttttgc	agggttttat	tttataaaat	ccaagcgccg	tgttgattgt	60
gttttctctg	ttttcagccc	cccgactcca	gcccgcagca	catttccgct	gtccgctcagt	120
aattgtgtcc	tctctttatg	cttgcttggg	gaatgttggt	ttctgactag	gctgatcatt	180
atctaaagaa	tctaattctg	ttgattttta	aaacttttag	gaccataaac	gttggtgttca	240
tatatggaca	tggaaatatt	tatataatth	tatagaaaat	aaccttttag	atggtcaaag	300
tgtaaggagt	tttttttgtc	agataatcat	ttctacttca	aaaacatttc	atgcaatatt	360
agaataaagt	tcctgtcatt	cctctnnnan	aaaaannnnn	nnnnnnnanna	nnnnnnnnnn	420
nggaanannn	nnnnnnnnnn	aaaaaagtac	ctgcccnggc	ggccgttcaa	aaggcgcaatt	480
ccaccactg	gcggccgttc	taatggatcc	anctcggacc	aacctggnga	aacatggcat	540
acctgttctt	ggngaaatgg	tntcccttac	aattcccaca	aataaaaccg	g	591

<210> 491

<211> 583

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(583)

<223> n = A,T,C or G

<400> 491

ggtacatata	aatccttttg	gtgtcacttg	tagcaagcct	tgcttctgca	gttttcggat	60
tttctcaaaa	gctttgttgc	gcttgcgtag	aattcgaggt	ggactaaagc	caacagcatc	120
gataagtttc	cgcctaaaga	aaccaatgtt	tgcaagtag	ataggagatg	gacatctgaa	180
aattttcact	ccttctggct	catacatatc	ataataatct	tttttattct	tatagatggt	240
ggttcttcca	atattagcca	gcgtgtctga	ttttggaaat	tgggtcctga	acacgatggt	300

tagcagttga	aatgccacac	tagctgccag	gcctaaccgg	agtcccagga	caatgggtgaa	360
agatgaaaagg	catgaaccca	aataaacaat	catatttggn	cnttccccca	atctgctatt	420
ttaaccaact	gcatcaacat	tcctttaagt	tccaatgcta	aactggcgang	acnggcnttt	480
gtagaagngc	cangaaaaat	cagngcttga	cgacaatcac	accatgatgn	nccataancc	540
acaatctggg	nttggctcnn	ggcctctgaa	cnnngactgg	nag		583

<210> 492
 <211> 597
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(597)
 <223> n = A,T,C or G

<400> 492	
acgcggggggg	tggcacggag gaaccaggag cgtgccctgc gcaccgtctg gagctccgga 60
gatgacaagg	agcagctggg gaagaacaca tatgtcctgt gaccgccctg tcgccaagag 120
gactgggggaa	gggaggggag actatgtgtg agcttttttt aaatagaggg attgactcgg 180
atttgagtga	tcattagggc tgaggtctgt ttctctggga ggtaggacgg ctgcttcctg 240
gtctggcgang	gatgggtttg ctttggaat cctctangag gctcctcctc gcattggcctg 300
cagnctggca	acaaccccgga gttgttcct cgctgacga tttcttcct ncaggtagag 360
ttttctttgc	ttatgttgaa ttccattgcc tttttctcat cacaaaaaat gatgtggga 420
atcgnttctt	ttgtttggct gaattatggg ntttttaant ataaaccaa nttttttatt 480
aacattctta	aanaagggaa agtnnaatgt ncnttggnc cnaaccncgt aanggcnaat 540
ttcanccent	ggnggccgtn nttnnngatc cnnncnngnn ccaannntgg nntantn 597

<210> 493
 <211> 591
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(591)
 <223> n = A,T,C or G

<400> 493	
acggatgcta	cttgtccaat gatggtaaaa gggtagctta ctggttgctc tccgattcag 60
gttagaatga	ggaggtctgc ggctaggagt caataaagtg attggcttag tgggcgaaat 120
attatgcttt	gttgtttgga tatatggagg atggggatta ttgctaggat gaggatggat 180
agtaataggg	caaggacgcc tcctagtttg ttagggacgg atcggagaat tgtgtaggcg 240
aataggaaat	atcattcggg cttgatgtgg ggaggggtgt ttaaggggtt ggctagggtta 300
taattgtctg	ggtcgcctag gaggtctggg gagaatagt ttaatgtcat taaggagaga 360
aggaagagaa	gtaagccgag ggcgtctttg attgtgtagt aagggtggaa ggtgatttta 420
tcggaatggg	aggtgattcc taaggggggtg gttgatcccg tttcctgcca agaataagaa 480
gtggaatgct	gctagggtctg cattaatgaa ggccaagatg aaatgaaagg taaanaatcn 540
ngtgangggg	gactgctact gatancctct caaatcatga ataggntgtc c 591

<210> 494
 <211> 374
 <212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(374)

<223> n = A,T,C or G

<400> 494

ggtacttttt	tttttttttt	tttttttttt	tttttttagnt	catgtctttt	attaactcat	60
acagttactt	gtcttctggt	ttgttgaaac	agtaagtcn	acaacatttg	ccacaataat	120
gtctgtcaaa	gtgacttgcc	ataaacaccc	cagcaccaca	ttcatcanaa	gggcactctc	180
gacgaaggcg	actaattttg	ccattctcat	ccaccttata	atatttcagg	acagccagct	240
taaccttctt	tctcttggtc	ttattcttct	tgggagnggt	gtaagacttc	ttcttccttt	300
tcttagcacc	accacgaagt	ctcaacacaa	gatgaagagt	agactccttt	tgaatattgt	360
aagtcagaca	aagt					374

<210> 495

<211> 597

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(597)

<223> n = A,T,C or G

<400> 495

actgggagaa	ggtgctgacg	ccgacgaagt	ggtggatggg	cttcccgtcg	caggtgaacc	60
tcctggtgcc	atcctgcagg	gtcccccgag	gattgcctag	atcatttttc	aagcagtagt	120
tgctttctgg	gtttttacaa	attctgcatt	ttccacactg	aggagtaaa	agcgggatga	180
ctttatcacc	tggtttgact	gtagtcaccc	cttctccaac	actttccaag	atgccggctg	240
cctcatggcc	taaaatcaca	ggaagggggg	tcaccagggt	gccactaacc	acatgctcat	300
ctgaacgaca	gattcctgca	gccaccatct	taatgcgaac	ttcatgagcc	ttaggagggtg	360
caacctctac	ctcctcaatg	gaaaagggtt	tctttaactc	ccatagcaca	actgctttgc	420
atgtgattac	ctgtaaactc	agctacttgt	gaaggctgag	gcanganaat	actttgaacc	480
ccggaaggca	aaggttgcaa	tgagccnana	acaccattgn	acttccanct	gggcaatana	540
aaaaaactca	tttttcctgc	tggctcaaat	gatctgcttc	ttgcaaacaa	gagntgn	597

<210> 496

<211> 604

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(604)

<223> n = A,T,C or G

<400> 496

ggacgcgggt	gctgactgca	tagctctttt	tcttgagagg	ctctccattt	tgattcagaa	60
agttagcata	tttattacca	atgaatttga	aaccagggtt	tttttttttt	tttgggtgat	120
gtaaaaccaa	ctccctgcc	ccaaaataat	taaaatagtc	acatttatct	ttattaggta	180
atcacttctt	aatttatagt	tcatactcta	agtatcaaaa	tcttccaatt	atcatgctca	240

cctgaaagag	gtatgctctc	ttaggaatac	agtttctagc	attaaacaaa	taaacaaggg	300
gagaaaaataa	aactcaagga	gtgaaaatca	ggagggtgtaa	taaaatgttc	ctcgatttcc	360
ccccgcgttt	tttttttttt	ttgactttgc	cttggaaagc	cagagcttcc	cgcattttct	420
ttactattct	ttttaaaaaa	agtttctactg	ngtaaaagaa	catatttgcc	taaacatang	480
tcaattatat	gtctccatta	naaaaaaata	attggnaaac	attgtctana	actagttcca	540
aaataattaa	gggggaaatc	tntaatnttt	ttaaagtgcc	naaanaatgc	ctaanttaaa	600
antt						604

<210> 497
 <211> 587
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(587)
 <223> n = A,T,C or G

acattaatga	aatgtttcca	aagaaatact	gaacaatata	tactctagtt	tgctgaggtt	60
ccagctcgag	ttcaaacctt	attcctgtgc	aataaaaaatc	agcatggatc	ttagatgac	120
tagaatacac	tgtgttttga	aatccacagc	tggttttcatt	tttaaccatt	atgaaaaacc	180
agtacttttt	tttttttttt	tttttttttc	nctnggacca	taaattttta	ttggcaggtc	240
aggaaaaaag	cggggggtaa	gggtcccttc	cttcccatcc	ctctacccan	aanacacctt	300
ccaaaggaca	gcagaagccc	cagagcctgc	tgcttcagag	gaccttgag	gcagacaaat	360
tggtgtagn	atcttctgt	ccctcaanca	ggctgcggt	ggtggnaatc	tnctgctcca	420
gccgcgactt	gatgtccatg	aaccgctggt	cctcggccgc	gacaccctta	nggcgaattn	480
caccnactgg	gnggcgttct	agtggatccg	actcggacca	acctngcgna	atcatggcan	540
actggttnct	gnnggaaatg	gtttccctnc	aattccccaa	cataccn		587

<210> 498
 <211> 354
 <212> DNA
 <213> Homo sapiens

acgcgggcaa	taaagctaaa	actcacctga	gttgtaaaaa	actccagttg	acacaaaata	60
gactacgaaa	gtggctttta	catatctgaa	cacacaatag	ctaagaccca	aactgggatt	120
agatacccca	ctatgcttag	ccctaaacct	caacagttaa	atcaacaaaa	ctgctcgcca	180
gaacactacg	agccacagct	taaaactcaa	aggacctggc	ggtgcttcat	atccctctag	240
aggagcctgt	tctgtaatcg	ataaaccccc	atcaacctca	ccacctcttg	ctcagcctat	300
ataccgccat	cttcagcaaa	ccctgatgaa	ggctacaaag	taagcgcaag	tacc	354

<210> 499
 <211> 632
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(632)
 <223> n = A,T,C or G

<400> 499
 nccgaggtac caactgcact cgttttggca ttgcagctaa atatcagttg gatccctactg 60
 cttccatttc tgcaaaaagtc aacaactcta gcttaattgg agtaggctat actcagactc 120
 tgaggcctgg tgtgaagctt acactctctg ctctggtaga tgggaagagc attaatgctg 180
 gaggccacaa ggntgggctc gccctggagt tggaggctta atccanctga aaagaaacct 240
 ttgggaatgg atatcaaaag aattggcctt aatatatttc cattgngacc agcagcaggc 300
 tttttttccc ccagaagatg atcaaaacaa aaggatgatc tcaacaagaa ctgtatttta 360
 aagtatttaa ganagtcttt ggtaactnng ttctaagtng gtatctaatt acccaatgct 420
 gcagtcctgc agtccctatt cattanttaa atgtatttaa ctggtaaatg ccctnccnc 480
 cataatgaaa taganccttt ttgaaaaccc aaaaaaaaaa aaaaaaaaaa aaaaaagtc 540
 ctgcccggcc ggccctcaaa nggngaattc canncctgg gggccgtact aanggatccn 600
 cccggnccaa cttggggaat atgggntant gn 632

<210> 500
 <211> 619
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(619)
 <223> n = A,T,C or G

<400> 500
 tccagcggnc cgccgggcn gtcactctata aaaggaaaag tgatggcatc tatatcataa 60
 atctcaagan gacctgggag aagcttctgc tggcagctcg tgcaattgtt gccattgaaa 120
 accctgctga tgtcagtgtt atactctcca ngaatactgg ccaaanggct gtgctgaant 180
 ttgctgctgc actggaacca ctccaattgc tggccgcttc actcctggaa ccttcactaa 240
 ccagatcagg caaccttccg ggaccacggn ttnttgtggt tactgacccc aaggctgacc 300
 accaacctnt cacggaggca ttttatgtta acctacctac cattgctgctg tgtaacacaa 360
 gattcttctc tgcctatgtg gacattggca ttccatgcaa caaccaaggg gagctcactc 420
 aatgggtttg atgtggtgga tctgctcggt naagtctgct catgcctggc accatttccg 480
 tgaacacatc ggagggatgc ctgattttac cttggccgga cacnctangg cgaattcacc 540
 acttgngccc gtatantgga tccactcgga ccaacttggg naaaatggca naatnttccg 600
 gggaaatgat ccctccaan 619

<210> 501
 <211> 605
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(605)
 <223> n = A,T,C or G

<400> 501
 accacactga gatagtgttt gccaggacct cccctcagca gaagctcatc attgtggaag 60
 gctgccaaag acagggtgct atcgtggctg tgactgggtga cggtgtgaat gactctccag 120
 ctttgaagaa agcaaacatt ggggttgcta tggggattgc tggctcagat gtgtccaagc 180
 aagctgctga catgattctt ctggatgaca actttgcctc aattgtgact ggagtagagg 240
 aaggtcgtct gatctttgat aacttgaaaa aatccattgc ttatacctta accagtaaca 300
 ttccccgaga tcaccccggt cctgatattt attattgcaa acattccact accactgggg 360

actgtcacca	tctctgcat	tgacttgggc	actgacatgg	gtncctgcat	ctcctggctt	420
atgagcaggc	tggagggcat	catgaanaaa	cagcccaaaa	tccaaacaga	caacttgtga	480
atgancnggt	gatcacatgg	ctatggcaga	atggatgatc	nagncttggg	aggttcttac	540
ttacttggaa	tctgntgaaa	cggttcttcc	aatacctntt	ggcctccatg	gnttggaanac	600
cctga						605

<210> 502
 <211> 627
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(627)
 <223> n = A,T,C or G

<400> 502						
acatcttgc	ggaaaatgct	gcccagggct	ctggagacgg	tggctgccc	ggctcccttc	60
actgtccagg	tcttgaaaga	ctcttggtca	tgaactgtct	cttcacaaag	caagtccacc	120
acttgctggg	tttatcattc	tgagggtcga	aaactttctc	acaaagtctc	agtccagtct	180
cttgcccttag	ctgttgtaaa	taggctctca	tcacttcac	ttctgtttgt	ttgcagggtt	240
ggcataaatt	gcgttaagt	gaaaaccagg	ctctccagga	atgggaaaat	taagtgattc	300
ccagcgtata	catttctttc	tcaccttggc	ttttggaatt	gcacttttgc	agtttcttca	360
nacattcaga	aatgtagaga	gttatatata	tcaangncct	atcaacttca	ttcttaattt	420
cataagtttt	gaaaaaaaca	ttggcccttg	aagtaataaa	tngntttatt	cccaaaatct	480
ggatcctttg	gcnetctnng	ggcangnccc	ttgaaatgac	ttttgatagg	gaacaangcc	540
ctgggtttcca	nnagnttggg	ttcnggaccn	taaaaaaaaa	gggaanccgg	nttttgnggg	600
gcccggttta	acccaagggc	cggancn				627

<210> 503
 <211> 629
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(629)
 <223> n = A,T,C or G

<400> 503						
ggtacattag	tagagctctc	caatcacagg	cagacgccag	tgtcctatga	ccagggggca	60
aatatggcca	aacagattgg	agcagctact	tatatcgaat	gctcagcttt	acagtcggaa	120
aatagcgtca	gagacatttt	tcacgttgcc	accttggcac	gtgtaaataa	gacaaaataa	180
aacgttaagc	ggaacaaatc	acagagagcc	acaaagcgga	tttcacacat	gcctagcaga	240
ccagaactct	cggcagttgc	tacggactta	cgaaaggaca	aagcgaagag	ctgcactgtg	300
atgtgaatct	ttcattatct	ttaatgaaga	caaaggaatc	tagtgtaaaa	aacaacagca	360
aacaaaaagg	tgaagtctaa	atgaagtgca	cagccaaagt	catgtatcca	gaggcttang	420
aggcgtttga	gangatactc	atctttttgg	aatnctgcct	taggttcggc	atgtanacca	480
agtgatgaga	agtgaatcca	tgggaaggtt	ttaatgtgac	ttggaaaata	tgccaaaaaa	540
tgagagatcc	aataacttna	ggaaaataag	ggggatccaa	tncctncccg	gcggccctta	600
ggggaattca	aacactnngg	gcggtatan				629

<210> 504

<211> 462
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(462)
 <223> n = A,T,C or G

<400> 504
 acgcggggagc tgagtgtccc gcgggggccc aagcgtttac tttgaaaaaa ttagagtgtt 60
 caaagcaggc ccgagccgcc tggataccgc agctaggaat aatggaatag gaccgcgggt 120
 ctatttttgt ggttttcgga actgaggcca tgattaagag ggacggccgg gggcattcgt 180
 attgcgcccgc tagagggttaa attccttgac cggcgcaaga cggaccagag cgaaagcatt 240
 tgccaagaat gttttcatta atcaagaacg aaagtcggag gttcgaagac gatcagatac 300
 cgtcgtagtt ccgaccataa acgatgcccc accggcgatg cggcggcggt attccatgac 360
 ccgncggggca gcttccggga aaccaaagtc tttgggttcc ngggggagta tnggtgcaaa 420
 aaaaaaaaaa aaaaaaaaaa gtcctnngnc gcgaccccct aa 462

<210> 505
 <211> 628
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(628)
 <223> n = A,T,C or G

<400> 505
 actttttttt tttttttttt tttgggggag gttatatggg tttaatagtt tttttaattt 60
 atttaggggg aatgatgggt gtctttggat atactacagc gatggctatt gaggagtatc 120
 ctgaggcatg ggggtcaggg gttgaggtct tggtagtgtt ttagtgggg ttagcgatgg 180
 aggtaggatt ggtgctgtgg gtgaaagant atgatggggt ggtggttgtg gtaaacttta 240
 atagttagg aagctgaata atttatgaag gagaggggtc agggttgatt cgggaggatc 300
 ctattggtgc gggggctttg tatgattatg ggcgttgatt agtantaatt actggttgaa 360
 cattgtttgt tgggtatata attgnaattg agattgctcg ggggaatang ttatgtgatt 420
 aggaataggg ttangatgag tgggaagaaa aaaagaaagg aantaaaagt ttaattattc 480
 cctttttggg ttgaagngat natggaagg gaaaatttgg gccttgaaat tgtttaagta 540
 atacttttct aataaggtaa gtctagaaga atagggcngg ttttggtctt aaaaaggcta 600
 aaaggggatt ggcggggtgg atccnccc 628

<210> 506
 <211> 612
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(612)
 <223> n = A,T,C or G

<400> 506

acggtagaac	tgctattatt	catcctatgt	gggtaattga	ggagtatgct	aagattttgc	60
cgtagctggg	tttggtttaa	tccacctcaa	ctgcctgcta	tgatggataa	gattgagaga	120
gtggggagaa	ggcttacgtt	cagtgaagga	gagatttggt	atatgattga	gatgggggct	180
agtttttgtc	atgtgagaag	aagcaggccg	gatgtcagag	gggtgccttg	ggtaacctct	240
gggactcaga	agtgaagggg	ggctattcct	agttttattg	ctatagccat	tatgattatt	300
aatgatgagt	attgattggg	agtattgggt	atgggttcatt	gccggagaag	tatatgtgtg	360
aagaggatag	ctattagaag	gattatggat	gccgttgctt	gcctgaagaa	atacttgatg	420
gcagcttctg	tggaaccaag	gtttatTTTT	ttggntagaa	ctggaataaa	acctacatgt	480
ttatttctan	gccactcagg	taaaaaatca	tgcnaactta	acccttgata	atgtgcctcc	540
aaaatgtaaa	aaaataacgg	ttggccccggg	ataatcccgt	ncttggccga	ccccctaggn	600
aattcccccc	tg					612

<210> 507
 <211> 632
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(632)
 <223> n = A,T,C or G

<400> 507	
ggtactacgt	tgtagccac
taggaggctt	cattcactga
ccaaaatcca	tttccctat
ttctcggcct	atccggaatg
gaaacatcct	atcatctgta
tcatgatttg	agaagccttc
taaacctgga	gtgactatat
acataaaatc	tagacaaaaa
catgggcttc	acgacttttt
cggtcanggn	gaaattcaac
tgggggaaaa	tgggaaagtg
ttccactatg	ttctatcaat
tctcaggcta	cacctagac
gcgtaaactc	aactttcttc
actcggacta	ccccgatgca
agcagtaata	ttaataattt
gaaaagtctc	aatagtagaa
cacctacca	caacttcgaa
aaactgggtt	nagccaaccc
aaaagtcttg	gccccggngg
cggtcctaang	ggtccaactc
ggnccaacc	
aa	

<210> 508
 <211> 336
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(336)
 <223> n = A,T,C or G

<400> 508	
cggtcctcta	atgctgctcn
ttagcgtggg	cgccggggccg
gctgggtcta	taaggaattg
cgatcatgtt	accatatcaa
ttcctctctg	aatctgttat
gcctttcttt	tcaaaaaaaa
cccggccgca	ntgtgattgg
aggtacaact	tccaaaaagg
ggcacacata	tttatgctgt
tcaccactat	ctggagattt
gttggttgga	ttcantaata
aaaagt	
gaattcgecc	
gaanaaccaa	
ctgaaggnc	
cgaccgtgtt	
aatatgtaag	

<210> 509
 <211> 624
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(624)
 <223> n = A,T,C or G

<400> 509
 ggtacttttt tttttttttt ttttttttta tagatacaat tggctttttat ttgtgattca 60
 tgagtcaggg cagttttccat tctgcaaaat atagtgatag ctcctactgg gcaatacaac 120
 agtanaacag tgggttttgt aaaatgggaa tccaggaaca gaagaatata aataaattga 180
 tttaaataaa ctgattgggt aatttcagaa tacttcatat tacttttttc taagagttaa 240
 agcagaaaag actttcttac tgtgctgact canacagcct ggactctcat gtttttagga 300
 aaattttgct gttctgggat ctacctgctt cctcatgttt cagtgnagat atatggcatt 360
 taacatgact ggctccattc tggagtccca ggctgtccct aaatgagaag ttgactaaac 420
 ataagggnatt aacactactg ncagggtacca tcattttggc ttncatcatt catanggtat 480
 gatgnccnc naatcatacc tttattttgag tttttgncat tccnncccaa aaaaaaatt 540
 ttgaanttta ccaaaggntg catgccacnt ttaaagggtt anaaaatcnc cccnccnggn 600
 actaatnttg ggccatcngn nggc 624

<210> 510
 <211> 619
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(619)
 <223> n = A,T,C or G

<400> 510
 acggatgcta cttgtccaat gatggtaaaa gggtagctta ctggttggtcc tccgattcag 60
 gttagaatga ggaggtctgc ggctaggagt caataaagtg attggcttag tgggcgaaat 120
 attatgcttt gttgtttgga tatatggagg atggggatta ttgctaggat gaggatggat 180
 agtaataggg caaggacgcc tcctagtttg ttagggacgg atcggagaat tgtgtaggcc 240
 aataggaaat atcattcggg cttgatgtgg ggaggggtgt ttaanggggt ggctagggta 300
 taattgtctg ggtcccctaa gaggtctggg gagaatagt ttaatgtcat taangagaga 360
 aagaaaaaaa ataagcccga gggcgtcttt gattgtgtan taaagggtgga angtgatttt 420
 atcngaattg gaagtgattn ctaagggtt ggtttgatcc ctttcgtgcc aaaataagaa 480
 gnggaatgct gctagggctc cataatgaag gcaanataaa atgaaagnaa aaaatctgta 540
 aggnnggact gctactaata ncctcccaa tcttgaacaa gntttnccaa ttntggatgg 600
 nggtataant tnaattcnn 619

<210> 511
 <211> 634
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature

<222> (1)...(634)

<223> n = A,T,C or G

<400> 511

cgaggacg	gggagatggc	ctagaagcaa	tgatagccat	cactgagaac	acctagcacc	60
caatcttgg	tcctaatacc	attctcccat	caaaggaacc	agagatcctt	ggagaaatgg	120
ttaagggaatg	aggcaggaaa	tatacaagat	aagcctggag	catcttatag	ctctagaaag	180
taagaaagta	cctgcctatt	ttagaatcct	agagaacatt	tcattgtaag	aaactagccc	240
attattttaag	tgtccacagt	atttttcatt	tcagtgggtcc	aagatgcgaa	ggtttccaga	300
cacaatcttg	ttctctaata	ctgctccagg	tgggatatca	attctgtccc	catgatttgc	360
aatgatgata	cccgttccct	ttaatgaaac	atttttttnc	aatgtcacat	cttctgaaac	420
tgngaggnga	tccaattcaa	gcataatctg	gntactttcc	aaatcntctt	agataatctt	480
gaaccttcgt	aaaagaactg	gctaattaan	ccanggccct	gnaggaaatt	ccccttttcc	540
tcattggcag	anancctgca	ttaaantntt	aagggttgnn	ttncnccan	aaactgtgtg	600
gtttgnaggc	aaaaaacggt	cttgggcatt	ancc			634

<210> 512

<211> 623

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(623)

<223> n = A,T,C or G

<400> 512

ggtacgcggg	cattgttcat	gactttaaca	agaaacttac	agcctattta	gatcttaacc	60
tggataagt	ctatgtgatc	cctctgaaca	cttccattgt	tatgccaccc	agaaacctac	120
tggagttact	tattaacatc	aaggctggaa	cctatttgcc	tcagtcctat	ctgattcatg	180
agcacatggt	tattactgat	cgatttgaaa	acattgatca	cctgggtttc	tttatttatc	240
gactgtgtca	tgacaaggaa	acttacaac	tgcaacgcag	agaaactatt	aaaggtattc	300
agaaacgtga	agccagcaat	tgtttcgcaa	ttcggcattt	tgaaaacaaa	tttgccgtgg	360
aaactttaat	ttgtcttgaa	cagtcaagaa	aaacattatt	gaggaaaatt	aatatcacag	420
cataccccc	cctttacatt	ttngncagng	gatatttttt	aaagcttctt	tnatgtaagt	480
agcaacangg	ntttactatc	tttcatttca	taaatcaatt	aaancnttnc	ctcaaaaaaa	540
aaaaaaaaaa	aaaaatacct	ncccggcggc	gctccaaagg	ggaattcaan	caccggnngc	600
cgtctttggg	accaacncgg	gcc				623

<210> 513

<211> 623

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(623)

<223> n = A,T,C or G

<400> 513

actgcctct	ccagatcagc	agttcaggag	agcacaggag	gcaaaacaca	gattgctggg	60
cttattgggtg	ccatcatcgt	gctgattgtc	gttctagcca	ttggatttct	cctggcacct	120
ctacaaaagt	ccgtcctggc	agcttttagca	ttgggaaact	taaagggaat	gctgatgcag	180

tttgctgaaa	taggcagatt	gtggcgaaaag	gacaaatatg	attgtttaat	ttggatcatg	240
accttcacat	tcaccattgt	cctgggactc	gggttaggcc	tggcagctag	tgtggcattt	300
caactgctaa	ccatcgtgtt	caggacccaa	tttccaaaat	gcagcacgct	ggctaataat	360
ggaagaacca	acatctataa	gaataaaaaa	gattattatg	atatgtatga	gccagaagga	420
gtgaaaattt	cagatgtcca	tcttctatct	actttgcnaa	cattggnttc	tttaggcngg	480
aacttatcga	tgctggtnng	ctttagtnca	ctttgnaatt	tacgcaagcc	ccacaaactt	540
tgaggaaatc	ccaaactgcn	aancangntt	nttcagtggg	acccaanggt	tttttttcct	600
tggcccgcacn	ccctangnga	atn				623

<210> 514
 <211> 627
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1) ... (627)
 <223> n = A,T,C or G

<400> 514						
ggtactcatg	cccgaactgtc	taccaggcac	acagactttg	aggagagggc	gtatgtcgtc	60
ttgatccgca	tcaatgatgg	gggtcggcca	cccttggaag	gcattgtttc	tttaccagtt	120
acattctgca	gttggtgtga	aggaagtgtg	ttccggccag	caggtcacca	gactgggata	180
cccactgtgg	gcatggcagt	tggtatactg	ctgaccaccc	ttctgggtgat	tggtataatt	240
ttagcagttg	tgtttatccg	cataaagaag	gataaaggca	aagataatgt	tgaaagtgtc	300
caagcatctg	aagtcaaacc	tctgagaagc	tgaatttgaa	aaggaatgtt	tgaatttata	360
tagcaagtgc	tatttcagca	acaaccatct	catcctatta	cttttcacat	aacgtgcatt	420
ataatttttt	aaacagatat	tccctcttgt	cctttaatat	ttgctaaata	tttctttttt	480
gangnggagt	cttgctctgt	cgnccaagct	ggantacctg	ncccggccgg	ccgtcaaagg	540
cgaattcaac	aactggcggc	cgtactaatg	gatcgacctc	ggaccaactt	ggggaacatg	600
gcanactngt	tcctgngnaa	aggatcc				627

<210> 515
 <211> 605
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1) ... (605)
 <223> n = A,T,C or G

<400> 515						
accattggtg	gccaatgat	ttgatggtaa	gggagggatc	gttgacctcg	tctgttatgt	60
aaaggatgcc	gtanggatgg	gagggcgatg	aggactagga	tgatggcggg	caggatagtt	120
cagacggttt	ctatttcctg	agcgtctgag	atgttagtat	tagttaagtt	ttgttgtgag	180
tgttaggaaa	agggcataca	ggactaggaa	gcagataagg	aaaatgatta	tgagggccgt	240
gatcatgaaa	ggtgataagc	tcttctatga	taggggaaag	taancgtctt	gtanacctac	300
ttgcgctgca	tgtgccatcc	cgccgtaccc	taacccgtgc	aaaggtagca	taatcacttg	360
ttccttaatt	aagggacctg	tatgaatggc	ttcaccaggg	ttcaactgtc	tcttactttt	420
aaccagtga	attgacctgc	ccctgaanag	gcggcnttac	acaccagacg	agaaaacctt	480
tggagcttaa	ttattatcca	acatacctng	ccggaccccc	taaggcgaat	tccaccactt	540
gcggcgctcta	tggatccact	cggaccactt	ggggaaaagg	ctactgtcct	ggnaatgttt	600

cctcn

605

<210> 516
 <211> 464
 <212> DNA
 <213> Homo sapiens

 <220>
 <221> misc_feature
 <222> (1)...(464)
 <223> n = A,T,C or G

<400> 516
 ggtacaacta atccgtgaca aattaccaga ttaattttac tttattttctt caggcctggg 60
 gtttttcgat gagttcaa at ttgggatctt caaatttgaa ggtgggaaat gtattcatgt 120
 ctgcattacc aaacatttgc ttgagcttaa aaagctccct ctccagctct tgctgatact 180
 ctgaactagc atcaacaggt cctccagatg tctgtcgctt agatttgtat tctctaactct 240
 tgtccacaaa gagtttctgt ataggatcaa gtcccttatt aaatgccact gctgtaacac 300
 caatgttcct ccgcaaatgg actgagacgg ctgaccgaat gacagaggag aacctgaaga 360
 gcctctgaag aatcatgctg attccttgac tcagtccega gctgncaaag ccttcgccgc 420
 caccaccttc gntctacccc cgcgtacctg cccggcgggc gctc 464

<210> 517
 <211> 611
 <212> DNA
 <213> Homo sapiens

 <220>
 <221> misc_feature
 <222> (1)...(611)
 <223> n = A,T,C or G

<400> 517
 acccgagca cggagatctc gccggcttta cgttcacctc ggtgtctgca gcaccctccg 60
 cttectctcc taggcgacga gacccagtgg ctagaagttc accatgtcta ttctcaagat 120
 ccatgccagg gagatctttg actctcgag gaatcccact gttgaggttg atctcttcac 180
 ctcaaaagggt ctcttcagag ctgctgtgcc cagtgggtgct tcaactggta tctatgaggc 240
 cctagagctc cgggacaatg ataagactcg ctatatgggg aagggtgtct caaaggctgt 300
 tgagcacatc aataaaacta ttgcgcctgc cctgggttagc aagaaactga acgtcacaga 360
 acaagagaag attgacaaac tgatgatcga gatggatgga acagaaaata aatctaagtt 420
 tgggtgcgaac gccattctgg ggggtgtcctt tgccgtctgc naaactggtg ccgttgagaa 480
 ggggggtcccc tgtccttggc cggacacnct aaggcgaatt ccacacactg cggccgtact 540
 atggatcgac tcggnaccaa cttgggtaat atgggcatac tggtnctggn gaaatgtttc 600
 cctccaatcc a 611

<210> 518
 <211> 435
 <212> DNA
 <213> Homo sapiens

 <220>
 <221> misc_feature
 <222> (1)...(435)

<223> n = A,T,C or G

<400> 518

cgaggtactt	tntttttttt	tttttttttt	ttttaagagg	aaaacccggt	aatgatgtcg	60
gggttgaggg	ataggaggag	aatgggggat	aggtgtatga	acatgagggg	gttttctcgt	120
gtgaatgagg	gttttatgtt	gttaatgtgg	tgggtgagtg	agccccattg	tgttgaggta	180
aatatgtaga	gggagtatag	ggctgtgact	agtatgttga	gtcctgtaag	taggagagtg	240
atatttgatc	aggagaacgt	ggttactagc	acagagagtt	ctcccagtag	gttaatagtg	300
gggggtaagg	cgaggtttagc	gaggcttgct	agaagtcac	aaaaagctat	tagtgggagt	360
agagtttgaa	gtccttgaaa	gaggattatg	atgccactgt	gaatgccttc	ctagtgtgag	420
tttgctagcc	cgcgt					435

<210> 519

<211> 407

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(407)

<223> n = A,T,C or G

<400> 519

actttntttt	tttttttttt	tttttttttt	ncagctttgc	aaccatactc	cccccggaac	60
ccaaagactt	tggtttcccg	gaagctgccc	ggcgggtcat	gggaataacg	ccgccgcac	120
gccggtcggc	atcgtttatg	gtcggaaacta	cnacggtntn	tgatcgtntt	cnaacctccg	180
actttcgttc	ttgattaatg	aaaacattct	tggcaaatgc	tttcgctctg	gtccgtnttg	240
cgccgggtcca	anaatttcac	ctctagcggc	gcaatacnaa	tgcccccggc	cgcccccttt	300
aatcatggcc	tcagttccga	aaaccaacaa	aataaaaaccg	cggtcctatt	ccattatgcc	360
tagctgcggg	atccaggcgg	tccccggtac	ctnggccgng	accacgc		407

<210> 520

<211> 613

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(613)

<223> n = A,T,C or G

<400> 520

accttctggg	gcatacaaca	tggcagcagg	gcctcgggaa	gaggggtagg	aggaccgagc	60
agcattctct	gtagaggaag	acaggaaagg	agaccctctt	ggcacacatt	tatggagggg	120
tgtccctgaa	gagaagggca	ggtgggagag	gttccctggt	acttaagaga	aggaccagt	180
ggcaaagagc	acaatgaaga	ggatgatgat	aaaaacaatc	acgcagataa	ggacaatcat	240
cttcacgttc	tccaccaga	atttccgagc	caccttctgc	gatgtcgtct	tgaagtgtct	300
agatgtggct	tccagatcct	ctgtcttggt	gctggagatgt	tccaagtgtt	ccccccgggc	360
caggatccgc	tccacattct	gggtcataat	attcttaact	ccctccacct	cactttgcag	420
gttccgcaca	cgatcatttc	cttcaccttc	actggcttnc	tncatgtctc	aaagcaccaca	480
gccggcagta	agtgaatcgc	ctatcggntt	cttccaggng	ggcctanttn	anttctgggtg	540
gtcaactttc	cccgcgtact	tgggcggacc	ccctaaggng	aattcactgg	cggccgtctt	600
tggatccacc	cgn					613

<210> 521
 <211> 606
 <212> DNA
 <213> Homo sapiens

 <220>
 <221> misc_feature
 <222> (1)...(606)
 <223> n = A,T,C or G

<400> 521
 actgcagtaa aagctttaac aggtggaatt gccacttat tcaaacagaa taagggtgtt 60
 catgtcaatg gatatggaaa gataactggc aaaaatcaag tcaactgctac gaaagctgat 120
 ggcggcactc aggttattga tacaagaac attcttatag ccacgggttc agaagttact 180
 ccttttcctg gaatcacgat agatgaagat acaatagtgt catctacagg tgctttatct 240
 ttaaaaaaag ttccagaaaa gatgggtgtt attgggtgcag gagtaatagg tgtagaattg 300
 ggttcagttt ggcaaagact tgggtgcagat gtgacagcag ttgaattttt angtcatgta 360
 ggtggagttg gaattgatat ggagatatct aaaaactttc aacgcaccc tcaaaaaacag 420
 gggtttaaat ttaattgaa tacaanggta ctgggtgctcc aagaagcana tggaaaaatt 480
 gatgttctat tgaanctctt ttgnngggaaa gctgaantnt acttggatgn cctnggccgn 540
 acncnctagg caatccncca ctgngncent ntttggtcen cctgggtccaa ctggggnnann 600
 nggctn 606

<210> 522
 <211> 617
 <212> DNA
 <213> Homo sapiens

 <220>
 <221> misc_feature
 <222> (1)...(617)
 <223> n = A,T,C or G

<400> 522
 acttgcgctt actttgtagc cttcatcagg gtttgctgaa gatggcggtg tatagggtga 60
 gcaagaggtg gtgagggtga tcgggggttta tcgattacag aacaggctcc tctagagggg 120
 tatgaagcac cgccagggtcc tttgagtttt aagctgtggc tcgtagtgtt ctggcgagca 180
 gttttgttga ttttaactgtt gaggttttagg gctaagcata gtgggggtatc taatcccagt 240
 ttgggtctta gctatttgtt gttcagatat gttaaagcca ctttcgtagt ctattttgtg 300
 tcaactggag ttttttataa ctcangtgag ttttagcttt attggggagg gggatgacta 360
 aaacactctt tacgccggct tctattgact tgggttaatc gtgtgacctg cggtggctgg 420
 cacgaaattg accaaccctg gggtttagtat aacttaatta aactttcntt attgctnaag 480
 gtaatcctgg tggttncctt ggggnggtng ntaggctaaa cgtttgaacc tcattctgcg 540
 gcctganctt ggccctttta tcggggggtt aaaaggggac tncttgaacn gggngcttct 600
 tggnaaatta taaaaca 617

<210> 523
 <211> 608
 <212> DNA
 <213> Homo sapiens

 <220>

<221> misc_feature
 <222> (1)...(608)
 <223> n = A,T,C or G

<400> 523
 cgagggtactt tttttttttt tttttttttt ttttggaana agtaagcctt tatttccttg 60
 ttttgcaaat aaaactggct aagttgggtg ctttttggtg attaagtcaa aganaccaa 120
 tcccatatcc tcgtccgact cctccgactc ttccttggt tcaaccttan ctggggctgc 180
 agcagcagca ggagcagctg tgggtggtagc aaccacaggg gcagcancca caaaggcaga 240
 tggatcaacc aanaaggcct tgaccttttc aacaagtggg aaggngtaat ccgtctcca 300
 aacaaagtca ggactcgttt gtctcttcaa aaaaaaaaag cganggctcg catttggtcc 360
 cttttggaca ttttgcaact cttcaatggg gttncattgg tnggtgatgg tataaacctt 420
 tganngnacct gcccggccgg ccgtcaaang gcaaattcac ccactggcgg ccgttctatg 480
 gatccnaccc ggncccaact tgggtaatat ggcanactgt tcctggggga aatgtntccc 540
 tnaaattccc acaaanacaa nccgaaccta aangtaanncn gggggccaag agggcnaccn 600
 ccttattg 608

<210> 524
 <211> 398
 <212> DNA
 <213> Homo sapiens

<400> 524
 ggtacaggat cctctaaaga gaccgcctgg ctgggtgctc aaaccacatg ggccgaccca 60
 aaagacgtca aaaccaagag ctgctcagga ggcactaaat gttgacggtc ttggccggct 120
 tcacatcctc aatttcagca gacagccagc ggtaagtgcg atgacgccgc agcacctcaa 180
 tggccttgag ttccagtggt gttgcctgaa taccaaggctc ttctaagcca ggcaggtgag 240
 gcaatttcat gtctgtgatg tgcacccgct ccactttatc ccttggtatc cagggctcaa 300
 atgggcttat ttcaaagact cttgctaccc atcgataggc aaaaagcggc aaggggaatg 360
 ggaggaacaa tctgtgagcc acaacaaaga tgtacctg 398

<210> 525
 <211> 607
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(607)
 <223> n = A,T,C or G

<400> 525
 actgttcttg ttggcccgag tggagactgg tgttctcaaa cccggtatgg tggtcacctt 60
 tgctccagtc aacgttacaa cggaagtaaa atctgtcgaa atgcaccatg aagctttgag 120
 tgaagctctt cctggggaca atgtgggctt caatgtcaag aatgtgtctg tcaaggatgt 180
 tcgtcgtggc aaccgttgct ggtgacagca aaaaatgacc accaatggaa gcagctggct 240
 tcaactgctc ggtgattatc ctgaaccatc caggccaaat aagcgccggc tatgccctg 300
 tattggattg ccacacggct cacattgcat gcaagtttgc tgagctgaag gaaaagattg 360
 atcgccgttc tggtaaaaaag ctggaaaaatg gccctaaatt cttgaaatct ggtgatgctg 420
 ccattgggtga tatgggtcct ggcaagccca tgtgtgtttg agagcttctc aaactattca 480
 ccttgggtcc tttgtgtcgt tgatatgaaa aaacagtgcg ggggtgtatc aaacatggac 540
 aaaagntnt tgacttgcag gtaccaatnt nccaaaacta aaaggtnaan aaatttncca 600
 aaccgcc 607

<210> 526
 <211> 624
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(624)
 <223> n = A,T,C or G

<400> 526
 cgagggtacgc ggggggaagct ctgtttggtg ctttggatcc atttccatcg gtccttacag 60
 ccgctcgtca gactccagca gccaaagatgg tgaagcagat cgagagcaag actgcttttc 120
 aggaagcctt ggacgctgca ggtgataaac ttgtagtagt tgacttctca gccacgtggt 180
 gtgggccttg caaaatgatc aagcctttct ttcattccct ctctgaaaag tattccaacg 240
 tgatattcct tgaagtagat gtggatgact gtcaggatgt tgcttcagag tgtgaagtca 300
 aatgcatgcc aacattccag ttttttaaga agggacaaaa ggtgggtgaa ttttctggag 360
 ccaataagga aaagcttgaa gccaccatta atgaattagt ctaatcatgt tttctgaaaa 420
 tataaccagc ccattggcta tttaaaactt gtaatttttt taatttacca aaatntaaaa 480
 tntgaagacn taaccagtt gncatctgcg tgacaatnaa acattaatgc tacactttta 540
 aaaaaaaaaa aaaaaaaaaa gtcctgccng cggccctcaa aggggaattc cacacctggg 600
 ggccgtcttt nggncccacc cggn 624

<210> 527
 <211> 611
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(611)
 <223> n = A,T,C or G

<400> 527
 acagagtgc actgaacaga tcacaaagca cgagaaacat tagttctctc cctccccagc 60
 gtctccttcg tctccctggg tttccgatgt ccacagagtg agattgtccc taagtaactg 120
 catgatcaga gtgctgtctt tataagactc ttcattcagc gtatccaatt cagcaattgc 180
 ttcataaat gccgtttttg ccaggctaca ggccttttca ggagagttaa gaatctcata 240
 gtaaaagact gagaaattta gtgccagacc aagacgaatt ggggtgtgtag gctgcatttc 300
 tttcttacta atttcaaagt cttcctggta agcctgctgg gagttcgaca cagtggtttg 360
 tttgttgctc cagatgccac ttcagaaaga tcctaaaata atctcctttc attttcaagt 420
 agaacacctt actttctggg tgtgtagcat tgggaataaa atatttgtcc acagcttcag 480
 aacatcattg cagatgtcct gcagtctggc tntatctttt acggnacctc ggccgggaca 540
 ccctanggcg aattccacac ctggcgcccg tctantggac ngctnggcca cttgggnana 600
 tggtactgt t 611

<210> 528
 <211> 615
 <212> DNA
 <213> Homo sapiens

<220>

<221> misc_feature
 <222> (1)...(615)
 <223> n = A,T,C or G

<400> 528
 ggtacttttt tttttttttt ttttttttga gacggagtct tgttcagctg cccaggctgg 60
 agtgcagtgg ctcgatcttc gctcactgca accaccgtct cctgggttca agcgattctc 120
 ctgtctcagc ctcccaagta gctgggatta caggccacca ccatcatgcc cggctaattt 180
 ttgtatattg gtagagacgg agtttcacta tgttgggcag gctgggtctg aactcctcac 240
 ctcaggatgat ccgcccgtct tggcctccca aagtgtctagg attacaggcg taagccacca 300
 tgccctggcca gatgatgtat ttaaatatca taccaaaactc tgtgtattta tataaagaaa 360
 gactggtaaa agacttcctn attttaaaaa aaaccaaacc ccaaaccaaa aaaaacttta 420
 cccttaccat tgntgcatat tgtgcagtat aaaacacaca cttattngga catganaaaa 480
 ccgnaagaaa gncccgggta aactggactt tgccgccttt aaaaataaaa tcnataaagn 540
 gccttgaggc cctttttcaa tgcaattttt taaccgggac ctgcengngn gcggtaaggg 600
 naatccanncn ctggn 615

<210> 529
 <211> 352
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(352)
 <223> n = A,T,C or G

<400> 529
 cgagggtactt tntttttttt tttttttttt tttttgggaa aagtcatgga ggccatgggg 60
 ttggcttgaa accagctttg ggggggttca ttcccttctt tttgtctan attttatgta 120
 tacgggttct tcgaatgtgt ggtaggggtg ggggcatcca tatagtcact ccagggtttat 180
 ggagggttct tctactatta ggacttttctg cttcgaagcg aaggcttctc aaatcatgaa 240
 aattattaat attactgctg ttagagaaat gaatgagcct acagatgata ggatgtttca 300
 tgtggtgtat gcatcggggg agtccgagta acgtcggggc attccccgcg gt 352

<210> 530
 <211> 769
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(769)
 <223> n = A,T,C or G

<400> 530
 ggtactgcat agattaaaga aataaactgc agtaaagcca ctcgtaagga atgaacgcca 60
 ttgccaatga taatcctctg cacatagggtg gaaatagcaa agaagtatag ttgcttcaga 120
 acaggtaata accaaaatga taaacaccag aaataggaag ccaaaccatgt aatacatctg 180
 gtgtgaccaa atactattca gaatgaagaa aagttgtata aagatgcagc caaagggcaa 240
 aatccctccc atgataatac caggcaagggt cttcgtgtag aacgactgtt caggaatctg 300
 acngtggaat ctgattggtt cgaactgggt gttcaatggc atcttcttaa aaccaangta 360
 tgcaccaata aacgtcnag gcacagatat gtanacaaaa gggccaatat ggcaancagt 420

gtncccaaaa	gaaatactgt	tgganatect	ctncccagag	gtcagattnt	tattaagaat	480
cnccccgcgt	cttttttttg	tttttttttt	gctccacttt	nnggtaaann	acntttnttt	540
aaaaatgttt	aantctantt	cctaattccc	atnttccttn	gctncnnnnc	tgctggnggn	600
ctttaaggga	antcncnnt	ggnggcgtcn	atganccact	tgnnactggn	tantagcnac	660
gttcgggang	ttcccnctt	ctaatatccg	gnagtaannc	ggctttgncn	cctantgggn	720
cngcttttcg	aacntgcctn	anannntccg	gagggtgatn	ttcttctnn		769

<210> 531
 <211> 777
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(777)
 <223> n = A,T,C or G

<400> 531						
cgaggtaactt	tttttttttt	tttttttttt	tggttttttt	tttttttctt	cagctaaaaac	60
agcgggaagag	gtgatttatt	atatggttgt	tacactcggc	cacaaataaa	cacagaaata	120
gtccanaatg	tcacagggtcc	aggacagagg	accaacatgg	gcattttgtt	tatgagcaag	180
gtgggtctna	naggtgatcg	gcgatcagag	ggcgatgaag	ttctagatcc	attgagacaa	240
gctctagaca	gtagcatgca	gtcccacaac	ttgtctccaa	agattcaggt	ttactcacgt	300
catccagcan	agaatggaaa	gtcaaatctt	ctgaattgct	atgtgtctgg	gtttcatcca	360
tcogacattg	aagttgactt	actgaanaat	ggagagagaa	ttgaaaaant	nggacattca	420
taactgnntt	tcancaagga	ctggtctttc	tatctcttgg	ncttnntttt	tcttntattt	480
ttttnttaca	tngggcctta	ctttaaaaaac	atacntttcc	nnnttacnnc	tggatgccaa	540
tngatttcna	nanatttccn	agnngaatec	tttngttatt	nttaaaaant	gggatctntn	600
gccancactt	ggctaantnt	taccnncctt	nggaatngtc	ntatgntcat	tnttggaaat	660
tnccccctn	angnnnttct	ttnngngnta	aaaattntta	atnnttaaat	tntttttcna	720
anattnttca	aataactaana	ntnntnnggg	nttanannaa	tnntgtanat	gggnnnng	777

<210> 532
 <211> 764
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(764)
 <223> n = A,T,C or G

<400> 532						
actttacaag	atagattgta	taagaagcca	aataatgaaa	gcctagaaaa	aactaattta	60
tacttatctg	aagggtacaa	attagacttt	taaattttct	ttgtagttgg	tggtgtttga	120
gggttggtta	gaaatgaaag	cctggatttt	gtgccatggt	tgtaatatag	tttgttcctt	180
gatcaaataa	tcagagaaaa	gaaacttaaa	gatctttgtc	tgtgaagaag	aaaattatct	240
ccctagttca	atctgtagtg	aaataagact	acagaaggca	ttgttttttc	ctttttattt	300
tntgnattat	atatttttct	taaatatggt	ttattgtctt	ctctaagcaa	aaagttctta	360
ataaacatag	tatttctctc	tgcgtcctat	ttcattagtg	aagacatagt	tcacctaaaa	420
tggcatnctg	ctctgaatct	agctttttat	aaatggctat	gtttttgatg	atatgtcaca	480
ttcaaatagg	cctaattaaa	tgtgttaaat	gnaatggcac	tcttataacc	ttaaaaataac	540
canaattaac	cctccaaaaa	aanaaaaaaa	aaaaaggcct	tggccgacnc	ntangngant	600

caccnctgng	gentcatgga	cncttggcca	cttgngaann	nggt nangnt	ccggganatt	660
tcccatncc	aattcanegg	acatagnnac	cnggccnaag	ngnnccantg	nngnnnnnct	720
tnnngaacng	gcctnaacn	cccggggngg	tngttcncc	tcnc		764

<210> 533
 <211> 773
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(773)
 <223> n = A,T,C or G

<400> 533						
cgaggtactt	tttttttttt	ttttacagat	acaattggct	tttattttgtg	attcatgagt	60
cagggcagtt	tccattctgc	aaaatatagt	gatatgctct	actgggcaat	acaacagtag	120
aacagtgggt	tttgtaaaat	gggaatccag	gaacagaaga	atataaataa	attgatttaa	180
ataaactgat	tgggttaattt	cagaatactt	catattactt	ttttctaaga	gttaaagcag	240
aaaggacttt	cttactgtgc	tgactcagac	agcctggact	ctcatgtttt	taggaaaatt	300
ttgtctgttc	tgggatctac	ctgcttcctc	atgttcagtg	tgagtatatg	gcatttagca	360
tgactgggtcc	attctggagt	caccaggctt	gcacctaaat	gagagttagac	taancatagg	420
cnttaacact	actgcagtac	catcatttng	acttcatcat	catanggtat	gatgnctct	480
aatnttncat	tatttgagtt	tggcattcag	ccacgagaga	atattgcctt	tgacaatgnt	540
gcatgcaact	ttaaagggtt	tagatnccgc	nccnggnact	attnngaaa	tcgggggtcc	600
ccnnaattgg	agtttnacct	ggcngaccnn	tgacnaccat	taaggantgt	tagantnccc	660
ttgaaccccc	tttacacct	ttgnatttcc	cggcntaacc	ccgggcnnta	agggatccnt	720
tggcntnngg	ccngcnaatn	gaagnacntt	ngannacgcc	tcncaccan	nng	773

<210> 534
 <211> 730
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(730)
 <223> n = A,T,C or G

<400> 534						
acacagacaa	atztatgcga	ccagggcaga	ggctgtagat	gattcatatt	tccaattggg	60
agggaggact	cgcttggctt	tataatatcg	agccaaacgg	tgaatccggc	tctctattag	120
aatcagacgg	aatttagcat	ccttatecct	tctgttcctc	tcaagatgct	ttcgaacagc	180
aactgctttc	ttaattaaat	ggtagagatc	ttcaggaaga	tcaggagcaa	gtcccttaga	240
cttaagaatt	cttaaaattt	tattgcctgt	cacaaaacgt	acaaattgac	caggctgttg	300
acggctgcct	ccacgtcggt	ggaataattc	tgacgaatct	gggagctcat	ggttggttgg	360
caagaaggag	ctaccacaaa	aacngtgctg	caggtccaga	agcaggagat	ggccgaaaaa	420
tgtcccgaag	ttcaaccgag	aggaaatcga	ggcggccgag	cttgaagaag	tcccgattgt	480
tcgtcaacct	gtgaacagaa	caaccccgga	ccgnantg	ccggtntctg	ccggacacct	540
angggaaatc	accctgnngc	gtctangacc	acttgcccaa	ctggganntg	gaaatntccg	600
ggaaagntcn	tcaatcccaa	ttaccgacna	agaactgggc	naagggtcnc	atctgggcnc	660
gccttnnnga	nctnccctta	annccccgga	gggtgntgg	tctcntetan	nntnnngtgg	720
nggnnaanag						730

<210> 535
 <211> 809
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(809)
 <223> n = A,T,C or G

<400> 535

gcgtggtcng	cggccgaggt	accaaactgca	gagccaggaa	aactttgaag	ccttcatgaa	60
ggcaatcggg	ctgccggaag	agctcatcca	gaaggggaag	gatgtcaagg	gggtgtcgga	120
aatcgtgcag	aatgggaagc	acttcaagtt	caccatcacc	gctgggtcca	aagtgatcca	180
aaacgaattc	acgggtggggg	aggaatgtga	gctggagaca	atgacagggg	ataaagtcaa	240
gacagtgggt	canttggaa	gtgacaataa	actggtgaca	actttcaaaa	acatcaagtc	300
tgtgaccgaa	ctcaacggng	acataatcac	caataccatg	acattgggtg	acattgtctt	360
caagagaatc	agcangagaa	tttaaacaag	tctgcatttc	atattatatt	antgntgtaa	420
aattaatgta	attaaagtga	actttgttta	aaaaaagann	nntnntntaa	atanaaaaaa	480
gtncctgcct	ggcggccggg	caaaggccaa	ttccagcnac	tngnggccnt	actagtgatc	540
nactcgtcna	acttgcgtaa	nntggcatac	ttgtntctng	taaatntatc	cctcncatcn	600
ccaaattcnn	ccgagcttaa	atntaaactg	gggcctatag	gnncactcct	tttggttgcg	660
ctgccnttnn	acgaacttcg	ncccttttat	antgcccccc	ganagggtng	tttggttttc	720
ntnntatatt	ctctctctcc	ttgngggttt	ttanggtngg	tcatntgggn	tctntanttt	780
agcttnga	ntantngntn	ttntntnt				809

<210> 536
 <211> 755
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(755)
 <223> n = A,T,C or G

<400> 536

actttttttt	tttttttttt	tttttttttt	atgaggaaaa	cccggtaatg	atgtcggggg	60
tgagggatag	gaggagaatg	ggggataggt	gtatgaacat	gaggggtgtt	tctcgtgtga	120
atgagggttt	tatgttggtt	atgtggtggg	tgagtgaagc	ccattgtgtt	gtggtaaata	180
tgtagaggga	gtatagggct	gtgactagta	tggtgagtc	tgtaagtagg	agagtgatat	240
ttgatcagga	gaacgtgggt	actagcacag	agagttctcc	cagtaggtta	atagtggggg	300
gtaaggcgag	gttagcgagg	cttgctagaa	gtcatcaaaa	agctattant	gggagtanag	360
tttgaagtcc	ttgagagagg	attatgatgc	nacttgtaat	gcnttcgant	ttgagtttgc	420
tagcngaata	nnatgaggat	gtantccnng	gccaatatna	aaatactccc	cgtnaacttn	480
aggggttnga	taaaatgctg	tctaccnng	actttgccgn	acaccttagg	caattcanca	540
ctggngccgt	ctnanggncc	cacttggncc	acnttgngga	acatggcnnc	ngtcntngga	600
aatgtttcnt	caattcccnc	ttcnaccgan	tantgnaacn	ggggcanaag	cncctatn	660
gtccctccct	tctngaactt	nnccnttaaa	tncccccggg	gggttnatgg	ctttctctnc	720
taanantnt	tnngnggnnt	tcnataanna	taann			755

<210> 537

<211> 794
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(794)
 <223> n = A,T,C or G

<400> 537

cgagggtacga	aaggggacaag	agaaataaagg	cctacttcac	aaagcgcctt	cccccgtaaa	60
tgatatcatc	tcaacttagt	attataccca	caccacacca	agaacagggg	ttgttaaaaa	120
aaaaaaaaaa	aaaaaaaaaa	aaaaaagtac	cttgactttg	ttcacagcat	gtaggggtgat	180
gagcactcac	aattgttgac	taaaatgctg	cttttaaaac	ataggaaagt	agaatgggtg	240
agtgcacaatc	catagcacia	gataaattga	gctagttaag	gcaaatacagg	taaaatagtc	300
atgattctat	gtaatgtaaa	ccagaaaaaa	taaatgttca	tgatttcaag	atgttatatt	360
aaagaaaaac	tttaaaaatt	attatatatt	tatagcaaaa	gttatcttaa	atatgaattc	420
tgttgtaatt	taatgctttt	gaatacacag	atntaaatga	agtattatct	gtaaaaatgt	480
atattagagt	tgtgatacag	agtatatctt	attcanccat	nttcatacta	ataatatgga	540
tttaaanata	tcctataaat	tcaatttcaa	nanaaaannnt	gntananaan	aanggnctgn	600
cggcggcgca	nggcaattca	acaatgnngc	gtctanggac	nactgggtcca	cttgggaana	660
ggcaacttnc	tgggaatgat	ccttcattcc	canntaccna	gctanttaac	nggggcaaaag	720
ggcccnntta	tgggnntngc	ntntnnaant	tgcccttaaa	accccgngng	gtgntggntc	780
tttnnnnttn	ngnt					794

<210> 538
 <211> 766
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(766)
 <223> n = A,T,C or G

<400> 538

ggtagcgggg	ggaaggcctt	cctttttcgt	ctgggctgcc	aacatgccat	ccagactgag	60
gaagaccggg	aaacttaggg	gccacgtgag	ccacggccac	ggccgcatag	gcaagcaccg	120
gaagcaccgc	ggcgcccgcg	gtaatgctgg	tggtctgcat	caccaccgga	tcaacttcga	180
caaataccac	ccaggctact	ttgggaaagt	tggtatgaag	cattaccact	taaagaggaa	240
ccagagcttc	tgcccaactg	tcaaccttga	caaattgtgg	actttggtca	gtgaacagac	300
acgggtgaat	gctgctaaaa	acaagactgg	ggctgtccca	tcattgatgt	ggtgcgatcg	360
gctactacaa	agttctggga	aagggaaagc	tccaaagcaa	nctgtcatcg	tgaaggccaa	420
atcttcacag	aagagctgag	gagaaaaata	agantgttgg	ggggcctgtg	tctggtgctt	480
gaagcccatt	ganggagttt	aattaatgct	actcttttga	aaaaaanann	aananaaaaa	540
gacctgcccg	gcggcngtaa	ggcaattcac	cnttgngccg	tctaaggacc	actggccaan	600
tgggaanang	gcnaanntcc	tgggaatngt	tcntcaattc	cccaattaac	caanaangna	660
acnngggcca	nnnggcaccc	ttatggntcc	ctncctttng	gaactngcct	tttaatccnc	720
cngagggntn	tgctccttnt	ntttntgnnt	ggggtaatna	aaagtn		766

<210> 539
 <211> 789
 <212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(789)

<223> n = A,T,C or G

<400> 539

accattggtg	gccaatgat	ttgatggtaa	gggagggatc	gttgacctcg	tctgttatgt	60
aaaggatg	tagggatggg	agggcgatga	ggactaggat	gatggcgggc	aggatagttc	120
agacggtttc	tatttcctga	gcgtctgaga	tgtagtatt	agttagtttt	gttgtgagt	180
ttaggaaaag	gcatacagga	ctaggaagca	gataaggaaa	atgattatga	gggcgtgatc	240
atgaaagg	ataagctctt	ctatgatagg	ggaagtagcg	tcttgtagac	ctacttgccg	300
tgcattgtcc	ccgcgtact	tgactttctt	ttntatttnt	tttattnttt	ttgactactt	360
agaattttca	caattcta	aagattgttc	caagtctctc	atgtgcaagc	tttaaaggat	420
gactcttgcc	atztatgtac	ctcggncgcg	accacgctaa	gggcaaattc	agcacacttg	480
cggncgttct	aagtggatcc	nagctcggtc	caaccttgccg	tatcatggca	tactgggtccc	540
tngtgaaatg	tatcccttac	aatcncacac	atcnaacccg	aanctaaann	taaanctggg	600
gccaataata	ctactncata	atgctcnctn	ctgccnttca	ncnggaacnt	gtgcncctnt	660
tatnatggca	acncggaagn	gtggttggtc	ttcctctcta	aaacntgnng	gntngttgga	720
aggganctct	aggnnnccgt	ccaattggan	ncgaaattnt	agctntntac	naaanattnt	780
tttttcnccg						789

<210> 540

<211> 747

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(747)

<223> n = A,T,C or G

<400> 540

actttttaagg	gcataataag	ggttaacatt	ctaggcagta	taaacacacc	ccataatgca	60
agtaataggt	aatctagaga	tgtggacttt	attgctatat	gggaattaca	tttaaatttg	120
agggcatttt	atataaagaa	aaatacagac	ctataaagtt	tggcatattc	attaagttat	180
cttttaatat	ttttttctag	aaaacagggtg	acatttgtat	ctacgataaa	aattttttata	240
cagaacctac	tgccctcaaac	tgaatcccat	caagaaaact	agtttctatt	gnattaagta	300
actcaaaata	aattatcact	tgcgaaaactt	gctttccaca	ctaaggtaag	tcagactaga	360
tgaacactcc	agaattttta	ctacagactg	ttttaagtta	gaagtgatgg	caattttataa	420
attgagaata	tcctccctga	tgccctaact	ggccaaacca	aaatctaaga	aagcagtgc	480
ncctcttact	atnatgaact	tctgaatang	gtagggacct	cctggcntan	nnatgaaaaan	540
ncctggccga	ccccctagg	aatccncaact	gggggcctnn	anggaccnan	tggccaantt	600
gnnannggg	aangnnccctg	gnaatgtccn	caattcncna	atnccgncna	aagtaacngg	660
gcccnnggg	annnnnangn	ngncnnccnn	nnngaannng	cccttnaann	ncccgngggg	720
ggngggntct	nnncnnnncc	nnngggg				747

<210> 541

<211> 773

<212> DNA

<213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(773)
 <223> n = A,T,C or G

<400> 541

cgagggtacca	tgaaatacat	atatttcata	aggttcagtt	acaaaatgga	ttgtttcaaa	60
tggcaatttc	ttacactaac	ctgattatga	aaaaaagaag	tctgtatcat	ctgcttccaa	120
gtctgttatg	tccaaatata	ttttaattat	gcatttattt	tgctactttt	ataaatatta	180
gagatttcac	cttaaattat	ttttgtaact	agttctagaa	catgttttcc	aattattatt	240
tttctaattg	agacatataa	ttgacctatg	tttatgcata	tatgttctct	acacagtga	300
acttttttta	aaaagaatag	taaagaaaat	gcggaagctc	tggtctctcca	aggcaaagtc	360
aaaaaaaaaa	aaaaagcggg	ggggaatgcg	aggaacattt	tattacacct	cctgatttca	420
ctccttgagt	ttattttctc	ccttggttat	tggttaatgc	tagaaaactgn	attctaagag	480
agcatccttt	tcagggtgacn	tgataattgg	aagatttgat	ccttccgcga	cctgnccggc	540
ggcgcgtcnaa	nggcnaattcc	anccactggc	ggcgggtctaa	nggatcnact	tggncacact	600
ggctaactgg	caacnggtcc	ngggngaaat	gnatccttaa	atccnactc	nacccgacct	660
aangaactgg	ggcaagggnc	accctatggn	gctcngcctt	cnngaantnn	ccncttaan	720
aaccnggggn	gntgggnntct	nnnnnannnn	cnnntgngg	gnntaanaag	ann	773

<210> 542
 <211> 770
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(770)
 <223> n = A,T,C or G

<400> 542

cgagggtactt	tttttttttt	tttttttttt	tttttttttag	aattctgaat	tttattagag	60
aatatatcta	aaatacaata	tttattaagt	tatgatatat	tgnetgaatg	gaaatatact	120
ctgnatcgca	actctaatta	taacaatttt	tacagataat	acttcattta	tatctctgna	180
attcaaaagt	cattaaatta	caacagaatt	catattttaag	ataactttgc	tataaatata	240
taataatttt	taaagttttt	ctttaatata	acatcttgaa	atcatgaaca	tttatttttt	300
ctgggttaca	ttcatagaat	catgactatt	ttacctgatt	tgccttaact	agctcaattt	360
atcttggtta	tggatttgca	ctcaccattc	tactttccta	tgtttaaaag	cacatttttag	420
tcacaattgn	gagtgtctcat	caccctacat	gctgtgacaa	aggcaagggc	ctgcccgggc	480
ggcgcgtcnaa	anggcgaatt	ccncaactgg	cggcgggtcca	agtggancga	ctcggaccaa	540
ctngggaaca	tggcaactgg	tcccgggggaa	atggaaccgt	acattcccca	natcagccga	600
ncttaggtaa	acngggggcn	aaggggggcta	cncataatgg	nggtccnccc	ttcatngaac	660
cgngccctnn	tatnatgcac	cccggagggt	nnttngcctc	ctcntnnnnn	ntcngntgtg	720
gagggagtcc	ngggggggtnc	canggggggna	aaaantgccn	ngncccgng		770

<210> 543
 <211> 748
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(748)

<223> n = A,T,C or G

<400> 543

accgcgggat	gcccctcatt	tacataaata	ttatactago	atttaccatc	tcacttctag	60
gaatactagt	atatcgctca	cacctcatat	cctccctact	atgcctagaa	ggaataatac	120
tatcgctggt	cattatagct	actctcataa	ccctcaacac	ccactccctc	ttagccaata	180
ttgtgcctat	tgccatacta	gtctttgccc	ctgcgaagca	gcggtggggc	tagccctact	240
agtctcaatc	tccaacacat	atggcctaga	ctacgtacat	atgctaggcc	atatggtaac	300
tctatgttta	acattttgag	gaactgccaa	actgttttcc	aaagtgacta	cactatttta	360
cattcccacc	ttgaaggtcc	aattttctcg	cattctacca	acatgggtaa	tggtctgctt	420
ttatttagca	accttaatgg	gtgtgaagag	atactcaatg	ggaatttgat	tgattcccta	480
angctaata	tttggnttct	ttctggctga	ngccagagnt	atctntttgg	gaaaattatt	540
naancttgnc	atttaacnng	cngatttatn	tgatntanaa	tnttntattt	gganccngcc	600
tttaagnaag	nttaaaattn	ncaatnttgg	ggcttncttt	tggccatgan	naannttaat	660
mntannanna	attnnntnch	annnggcnn	tnaannannn	nnnanaaana	annnttnnna	720
anaannactt	tttnnnnnna	cntggcgg				748

<210> 544

<211> 327

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(327)

<223> n = A,T,C or G

<400> 544

actttttttt	tttttttttt	tttttttttt	tttttttttt	ttggctctag	agggggtaga	60
gggggtgcta	tagggtaaat	acgggcccta	tttcaaagat	ttttagggga	attaattctg	120
ggacgatggg	catgaaactg	tggtttgctc	cacagatttc	anagcattga	ccgtagtata	180
cccccggtcg	tgtagcgggtg	aaagtgggtt	ggttttaaag	tccgggaatt	gcactctgtt	240
ttaagcctaa	tgtgggggaca	gctcatgagt	gcaagacgtc	ttgtgatgta	attattatac	300
gaatgggggc	ttnaatcggg	agtacct				327